MILWAUKEE COUNTY

Department of Administrative Services

Airport Engineering
Milwaukee Mitchell International Airport (MKE)
5300 South Howell Ave.
Milwaukee, Wisconsin 53207

REQUEST FOR PROPOSAL
FOR

Construction Testing Materials - Runway
7R-25L Pavement Rehabilitation

PROJECT NO. A392-20184

February 2021

MILWAUKEE
Mitchell International Airport

02/05/2021

To All Interested Consultants

Project : Construction Testing Materials - Runway 7R-25L Pavement Rehabilitation

Project No.: A392-20184

Subject : REQUEST FOR PROPOSAL (R.F.P.)

Milwaukee County Department of Administrative Services is requesting proposals for professional services for construction materials testing for the Runway 7R-25L Pavement Rehabilitation project.

I. **BACKGROUND**

Milwaukee Mitchell International Airport (MKE) is a medium hub airport located in Milwaukee, WI. The project consists primarily of the removal and replacement of the existing 14" concrete overlay on large portions of Runway 7R-25L at Milwaukee Mitchell International Airport (MKE) as well as some lean concrete and asphalt shoulder replacement.

The proposed work is located at MKE at 5300 S Howell Avenue. Refer to Attachment 1 for location.

II. **GENERAL PROJECT DESCRIPTION**

The consultant will provide materials testing services to document whether the materials tested are in accordance with the Standard Specifications for Airport Construction and the project specifications.

See attached set of plans for project specifics and quantities. The airport is proceeding with Base Bid + Alternates 1 through 5 and a modified Alternate 6 (CB1).

III. **SCOPE OF CONSULTANT SERVICES**:

The successful consultant shall provide all services as specified per the standard terms and conditions of the Milwaukee County Department of Administrative Services Consultant Agreement for Professional Services *(Type C)* (See attachment for sample).

a. GENERAL REQUIREMENTS

i. Materials testing should be, but not limited to the following items: (See specifications for additional information)

- Lean Concrete Base Course (P-306)
  - Air content, concrete cylinders for compressive strength, thickness with hardened cores provided by GC.
- Asphalt Mix Pavement Surface Course (P-403)
  - Specific gravity, air voids and thickness.
- Cement Concrete Pavement (P-501)
  - Field testing (slump, air content, temperature), beams for flexural strength, thickness with hardened cores provided by GC.

ii. Reports must be reviewed and approved by a P.E. prior to submitting.
iii. Reports must be finalized and submitted in a timely manner to Airport Engineering.
iv. Consultant field technicians must successfully submit a background check and be badged with Airport Security. (See attachment for additional information)
    - The selected consultant shall coordinate with the contractor and engineer and be readily available on the construction schedule to ensure no delay to construction.

b. TASK ITEMS

i. Item P-306 Lean Concrete Base Course
- *Perform all tasks designated as RPR responsibilities in FAA Spec 306-6 material acceptance, including but not limited to:*
    - *Assume 15 days paving, each day consist of approximately 1,200 square yards. (Field Lean Concrete Testing)*
    - *30 Compressive strength tests (Cylinder Testing).*
    - *30 Thickness measurement tests (Core Testing).*

ii. Item P-403 Asphalt Mix Pavement Surface Course
- *Perform all tasks designated as RPR responsibilities in FAA Spec 403-6 material acceptance, including but not limited to:*
    - *Assume 3 days paving, each day consisting of 1 sublot merged into 1 lot. (Field Asphalt Mix Testing)*
    - *3 Plant air voids tests.*
    - *6 Field density tests.*
    - *3 Pavement thickness tests.*

iii. Item P-501 Cement Concrete Pavement
- *Perform all tasks designated as RPR responsibilities in FAA Spec 501-6 material acceptance, including but not limited to:*
    - *Assume 70 days paving, each day consisting of 1 lot and 3 sublots. (Field Cement Concrete Testing - Slump, Air Content, Unit Weight, Temperature, each sublot)*
    - *420 Pavement beams. (70 days x 3 sublots x 2 specimens)*
    - *210 Pavement thickness tests. (70 days x 3 sublots x 1 specimen)*
    - *Summary of results (PWL).*

Estimated Quantities							
Item	**Days Onsite**	**Cylinder Tests**	**Beam Tests**	**Thickness**	**Air Content**	**Void Tests***	**Spec Grav**
P306	15	30	-	30	30	-	-
P403	3	-	-	-	-	3	6
P501	70	-	420	210	210	-	-

c. DELIVERABLES

i. Test reports should be prepared daily when field work or sample pickups are performed. These reports should be available for review as needed and the results made available to the Airport Engineering office.
ii. A final comprehensive report should be reviewed by a P.E. and submitted to the Airport Engineering office at the end of the project.

IV. **QUALITY CONTROL**

a. Milwaukee County reserves the right to request partial or full reimbursement from consultants for change orders resulting from errors and omissions in the services they are contracted to provide.

V. **PROJECT SCHEDULE**

a. 02/05/2021 RFP issued
b. 02/19/2021 Proposals Due
c. 03/15/2021 Contract NTP
d. 04/12/2021 Anticipated Construction Start
e. 10/01/2021 Anticipated Construction Completion
f. 11/01/2021 Final Report & Invoice Due

VI. **PRE-PROPOSAL MEETING**

a. No meeting will be held, please contact PM for questions. See contact info on page 7.

VII. **RELATED WORK BY OTHERS**

a. General Contractor to provide Consultant with hardened cores for thickness testing.

VIII. **SUBMISSION REQUIREMENTS:**

The proposal shall conform to Milwaukee County's Proposal Preparation, Submission and Evaluation Guidelines (see Attachment 3). The proposal shall include the Consultant Proposal Form (Attachment 4) and the following information:

a. Cover Page: Include project number and name, project location, consultant's name, address, telephone number, e-mail address, proposal date, etc.

b. Table of Contents: Include an identification of the material by section and page number.

c. Letter of Transmittal: The name and description of the organization submitting the proposal briefly stating the proposer’s understanding of the service to be provided.

d. Description of the Organization: A description of the organization submitting the proposal. Include the name, size, legal status (corporation, partnership, etc.), professional registration/certification, major type of activity or areas of consulting.

e. Description of the Organization’s Experience: Include a list of similar projects that the consultant has participated with during the past five years. (At least three) Giving a brief description of each project, the consultant’s participation, and a client contact reference and phone number.

f. Description of Project Team/Resumes: Provide an organizational structure of the consultant’s project team, including any subconsultants to be used for this project. Include the name of the Principal in Charge of this project along with the name, occupation and title of the Project Manager who will be in charge of this project.

g. Sub-Consultants: Indicate the names and addresses of any sub-consultants and/or associates proposed to be used in this project. State the capacity they would be used in and the approximate percentage of the total services they would provide. Also state their past experience in the field.

h. Project Approach: Provide a description of challenges you anticipate in this project and how you propose to overcome them. Discuss how you plan to staff the project to efficiently complete the work effort.

i. Project Schedule to Completion: Provide a timetable and relationship of tasks which are necessary to complete this project as noted in the “Project Schedule" section of this RFP.

j. Constant Effort: Include a spreadsheet/matrix listing the names, classifications, hourly rates and hours to be spent by each required task to complete the project as described in this RFP.

k. DBE Firm Goals: The Disadvantaged Business Enterprise participation goal for this project/contract is 17%.

   i. Compliance reporting is accomplished from collection of data in the Diversity Management and Compliance System, utilizing B2GNow software. Prime contractors are required to report payments received from the County and amounts paid to subcontractors in the system. Subcontractors will receive an automated email requesting them to confirm the amounts and whether the terms of the prompt payments policy were followed. There is no cost to the Prime or any subcontractor, the only requirement is to become a registered user and complete the one-hour webinar training.

   ii. Contact the Community Business Development Partners Office at 414-278-4747 or cbdp@milwaukeecountywi.gov for questions related to DBE requirements.

l. **Quality Control:** Submit a contract document quality control plan. Quality control is to be performed by individuals not assigned to the project on an ongoing basis.

IX. CONSULTANT SELECTION

a. Proposers must recognize this is not a bid procedure, and a Professional Services agreement will not be awarded solely on the basis of the low fee proposal. Milwaukee County reserves the right to accept or reject any and all proposals, issue addenda, request clarification, waive technicalities, alter the nature and/or scope of the proposed project, request additional submittals, and/or discontinue this process.

   The proposal evaluation team will be made up of three to five individuals with technical knowledge of the requirements and familiarity with the project. Depending on the number and quality of the proposals, Milwaukee County may decide to conduct interviews of a short-list of consultants. The evaluation team may select up to three consultants to attend an interview, which, if required, will be held during the weeks of February 22 & March 1. The interview will be evaluated based on project team, experience and qualifications, project understanding, and the overall presentation.

   The project manager will post this RFP, as well as any addendums and other information related to this project to the Milwaukee County Construction RFP website:

   http://county.milwaukee.gov/ConstructionBidsandR23075.htm

The consultant should consider information on this website to be part of the official RFP. Please check the site frequently. To allow time for proposal preparation, Milwaukee County will not post anything new within two days of the proposal due date.

X. **GENERAL REQUIREMENTS**

a. Selected consultant shall follow Milwaukee County Code of Ethics as follows: No person(s) with a personal financial interest in the approval or denial of a Contract being considered by a County department or with an agency funded and regulated by a County department, may make a campaign contribution to any County official who has approval authority over that Contract during its consideration. Contract consideration shall begin when a Contract is submitted directly to a County department or to an agency until the Contract has reached final disposition, including adoption, County Executive action, proceeding on veto (if necessary) or departmental approval.

b. The selected consultant must be an Equal Opportunity Employer.

c. The proposal shall conform with all attached documents. All proposals should use this RFP and its attachments as the sole basis for the proposal. The issuance of a written addendum is the only official method through which interpretation, clarification or additional information will be given.

d. All costs for preparing a proposal, attending the selection interview if required, or supplying additional information requested by Milwaukee County, is the sole responsibility of the submitting party. Material submitted will not be returned.

e. The proposal must be submitted in a single bound 8-1/2” x 11” document or be submitted via email printable on 8-1/2” x 11” paper.

f. With the signing and submission of a statement or proposal the submitting consultant certifies that the standard terms and conditions of the Agreement for Professional

Services (that will be used to contract with the selected consultant) has been read and understood and that the submitting consultant is ready, willing and able to sign the agreement when requested without making any substantive changes.

Submit four copies of the proposal, sealed in an envelope or equivalent, no later than February 19 by 2:00 p.m.

The proposals shall be addressed and submitted to:

Anthony Raab - Engineer
Milwaukee Mitchell International Airport (MKE)
5300 S. Howell Avenue
Administration Office room A260
Milwaukee, WI 53207

Or by email: araab@mitchellairport.com

Proposals submitted by telephone or fax will be rejected.

Please direct questions about this RFP to Anthony Raab at 414-659-3156 or araab@mitchellairport.com.

Sincerely,

_____

Anthony Raab - Project Manager

Attachments:

1. Project Plans & CB1
2. Pertinent Project Specifications
    - Airport Safety
    - C-110 Contractor Quality Control Program (CQCP)
    - P-306 Lean Concrete Base Course
    - P-403 Asphalt Mix Pavement Surface Course
    - P-501 Cement Concrete Pavement
3. Proposal Preparation, Submission and Evaluation
4. Consultant Proposal Form
5. DBE Forms
6. Sample Consulting Contract

ATTACHMENT 1

FULL SET OF PLANS & CB1

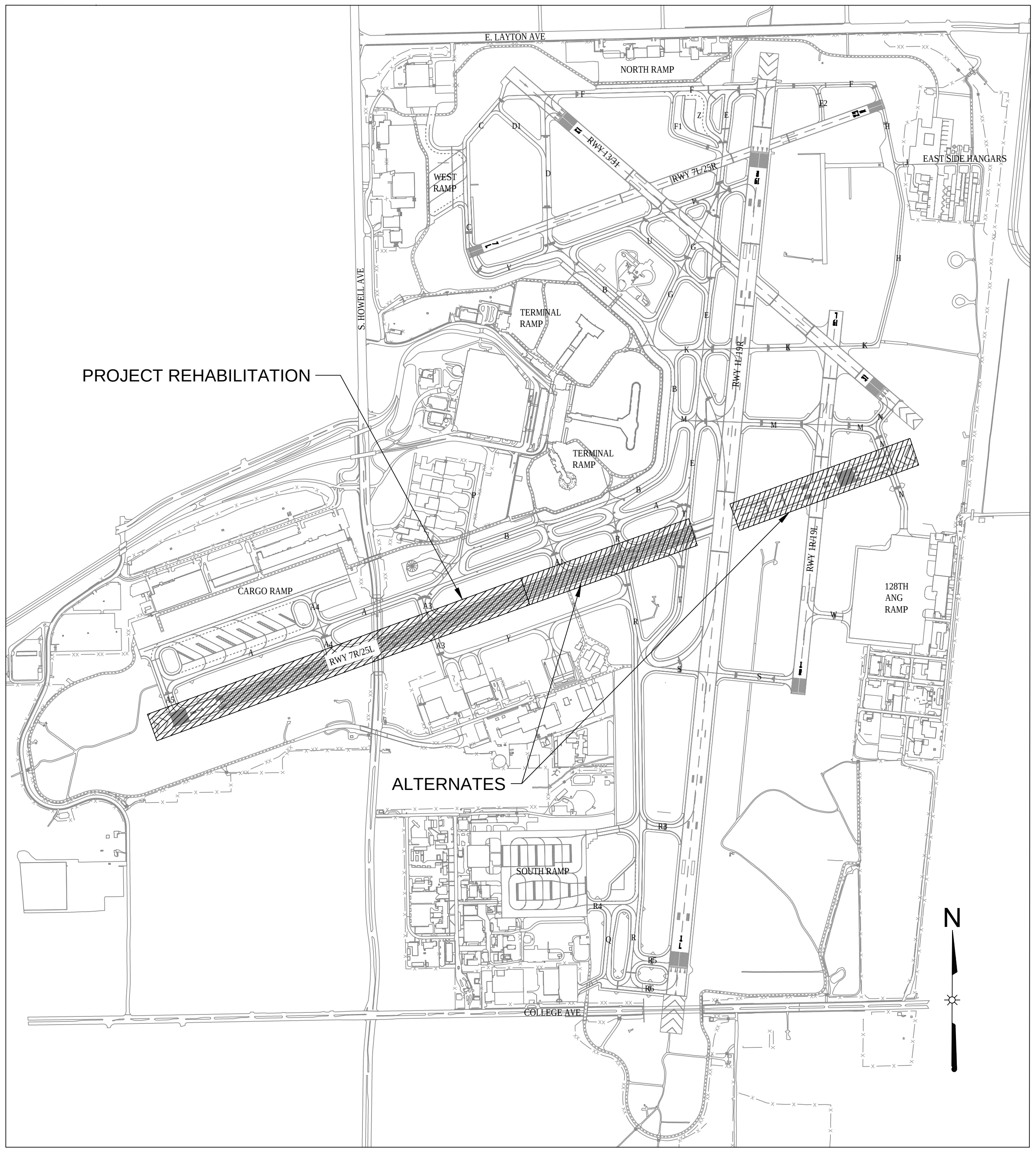
RUNWAY 7R-25L PAVEMENT REHABILITATION

GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)

5300 S. HOWELL AVE. MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 WEST WISCONSIN AVENUE, SUITE 1000 MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE MILWAUKEE, WI 53207

INDEX OF DRAWINGS



PROJECT LOCATION MAP

POINT OF CONTACT
Anthony Raab, Engineer
Milwaukee County - A&E + ES Section, GMIA
PHONE: 414-747-5774
araab@mitchellairport.com

AIRPORT DIRECTOR: DocuSigned by: Brian Dranzik F598B9FA1CF44EB... BRIAN DRANZIK

DIRECTOR, AE&ES SECTION, DAS - FM: DocuSigned by: Greg High B9605AA15A3846B... GREG HIGH

DAS - AE&ES UNIT HEAD: DocuSigned by: Jim Zsebe 633E30F2CA2647B... JAMES ZSEBE, P.E.

DAS - AE&ES PROJECT MANAGER: DocuSigned by: Anthony Raab E055D13827BC45C... ANTHONY RAAB, P.E.

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE, SUITE 1000; MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE; MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT # TBD
SITE NO: 290
BUILDING NO: N/A

PROJECT COVER SHEET
C001

Points of Interest

Point #	Latitude	Longitude	Description	Ground Elevation	Maximun Equipment Height
1	N42° 56' 21.05"	W87° 55' 07.07"	Area 01	726.99	751.99
2	N42° 56' 18.97"	W87° 55' 06.23"	Area 01	726.90	751.90
3	N42° 56' 38.70"	W87° 53' 54.60"	Area 01	677.60	702.60
4	N42° 56' 36.62"	W87° 53' 53.65"	Area 01	676.99	701.99
5	N42° 56' 40.30"	W87° 53' 47.96"	Area 02	674.30	699.30
6	N42° 56' 38.20"	W87° 53' 46.91"	Area 02	673.52	698.52
7	N42° 56' 42.30"	W87° 53' 39.93"	Area 01A	670.84	695.84
8	N42° 56' 40.22"	W87° 53' 38.99"	Area 01A	670.98	695.98
9	N42° 56' 48.39"	W87° 53' 15.09"	Area 01A	669.51	694.51
10	N42° 56' 46.29"	W87° 53' 14.04"	Area 01A	668.70	693.70

NOTE: THESE POINTS SUBMITTED TO FAA FOR OBSTRUCTION ANALYSIS AND AERONAUTICAL STUDY BY THE ENGINEER. (FAA Form 7460-1, *Notice of Proposed Construction or Alteration*)

Staging Area

Point #	Latitude	Longitude	Description	Ground Elevation	Maximun Equipment Height
100	N42° 56' 27.55"	W87° 55' 21.12"	Staging Area	719.32	744.32
101	N42° 56' 27.52"	W87° 55' 18.69"	Staging Area	717.33	742.33
102	N42° 56' 26.04"	W87° 55' 21.14"	Staging Area	720.40	745.40
103	N42° 56' 25.97"	W87° 55' 18.74"	Staging Area	718.44	743.44
105	N42° 57' 32.00"	W87° 52' 59.19"	Staging Area	714.83	739.83
106	N42° 57' 30.49"	W87° 52' 59.27"	Staging Area	681.39	706.39
107	N42° 57' 31.91"	W87° 52' 56.77"	Staging Area	691.59	716.59

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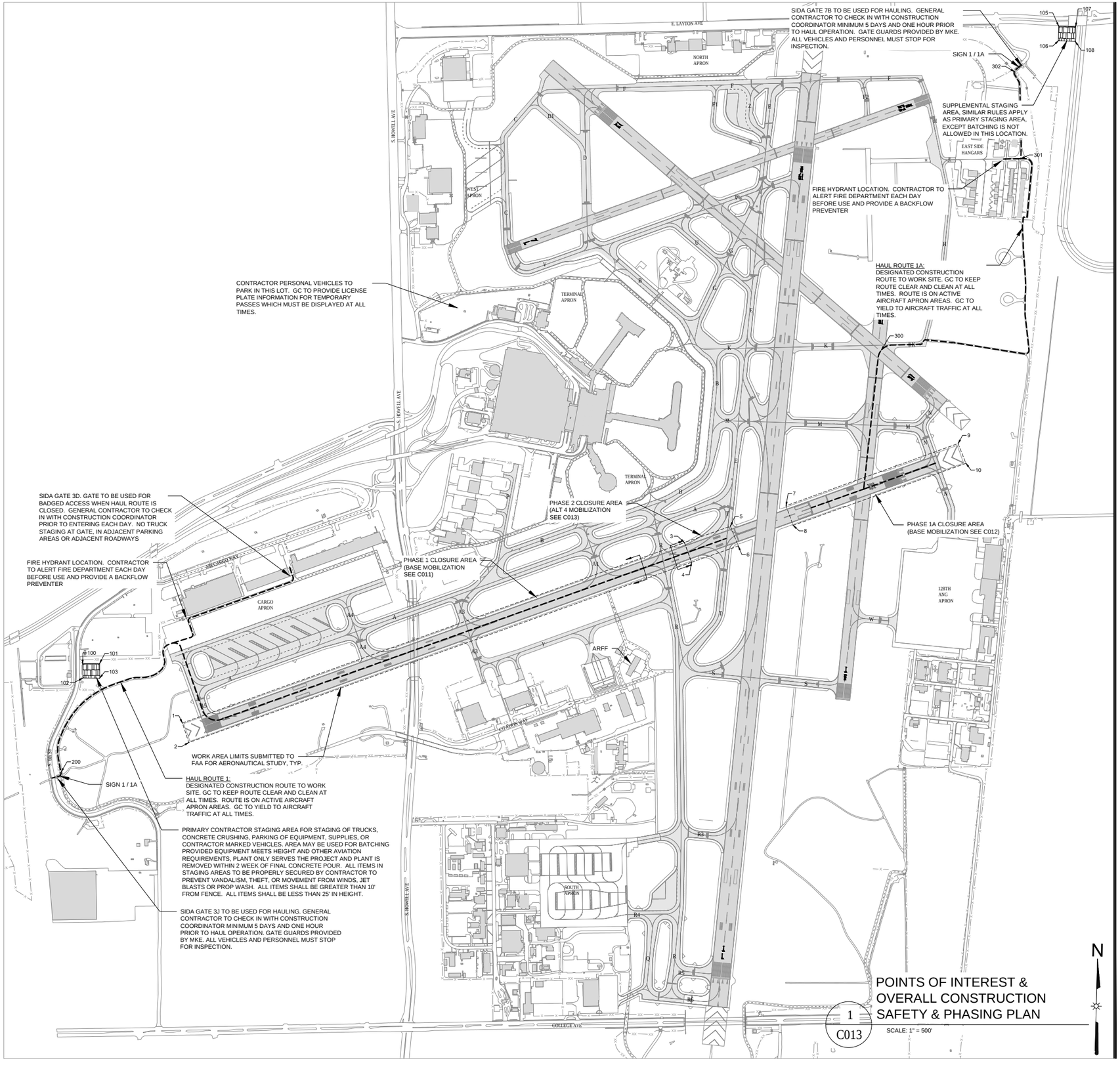
Haul Routes

Point #	Latitude	Longitude	Description	Ground Elevation	Maximun Equipment Height
200	N42° 56' 16.21"	W87° 55' 24.58"	Haul Route 01	733.02	758.02
300	N42° 56' 58.42"	W87° 53' 25.75"	Haul Route 01A	669.00	694.00
301	N42° 57' 18.18"	W87° 53' 05.09"	Haul Route 01A	670.00	695.00
302	N42° 57' 27.35"	W87° 53' 05.67"	Haul Route 01A	671.08	696.08

NOTE: THESE POINTS SUBMITTED TO FAA FOR OBSTRUCTION ANALYSIS AND AERONAUTICAL STUDY BY THE ENGINEER. (FAA Form 7460-1, *Notice of Proposed Construction or Alteration*)

IF CONTRACTOR REQUIRES EQUIPMENT IN EXCESS OF 25', A NEW 7460 MUST BE FILED BY THE CONTRACTOR. 7460 FORM MUST BE SUBMITTED 90 DAYS PRIOR TO THE START OF CONSTRUCTION.

NOTES:
1. SEE C011-C013 CONSTRUCTION SAFETY & PHASING PLANS FOR SPECIFIC CLOSURES AND OTHER INFORMATION
2. SEE C020 FOR CONSTRUCTION SAFETY & PHASING PLANS NOTES AND DETAILS



POINTS OF INTEREST & OVERALL CONSTRUCTION SAFETY & PHASING PLAN

1 / C013

SCALE: 1" = 500'

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE., SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE., MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

POINTS OF INTEREST AND OVERALL CONSTRUCTION SAFETY & PHASING PLAN

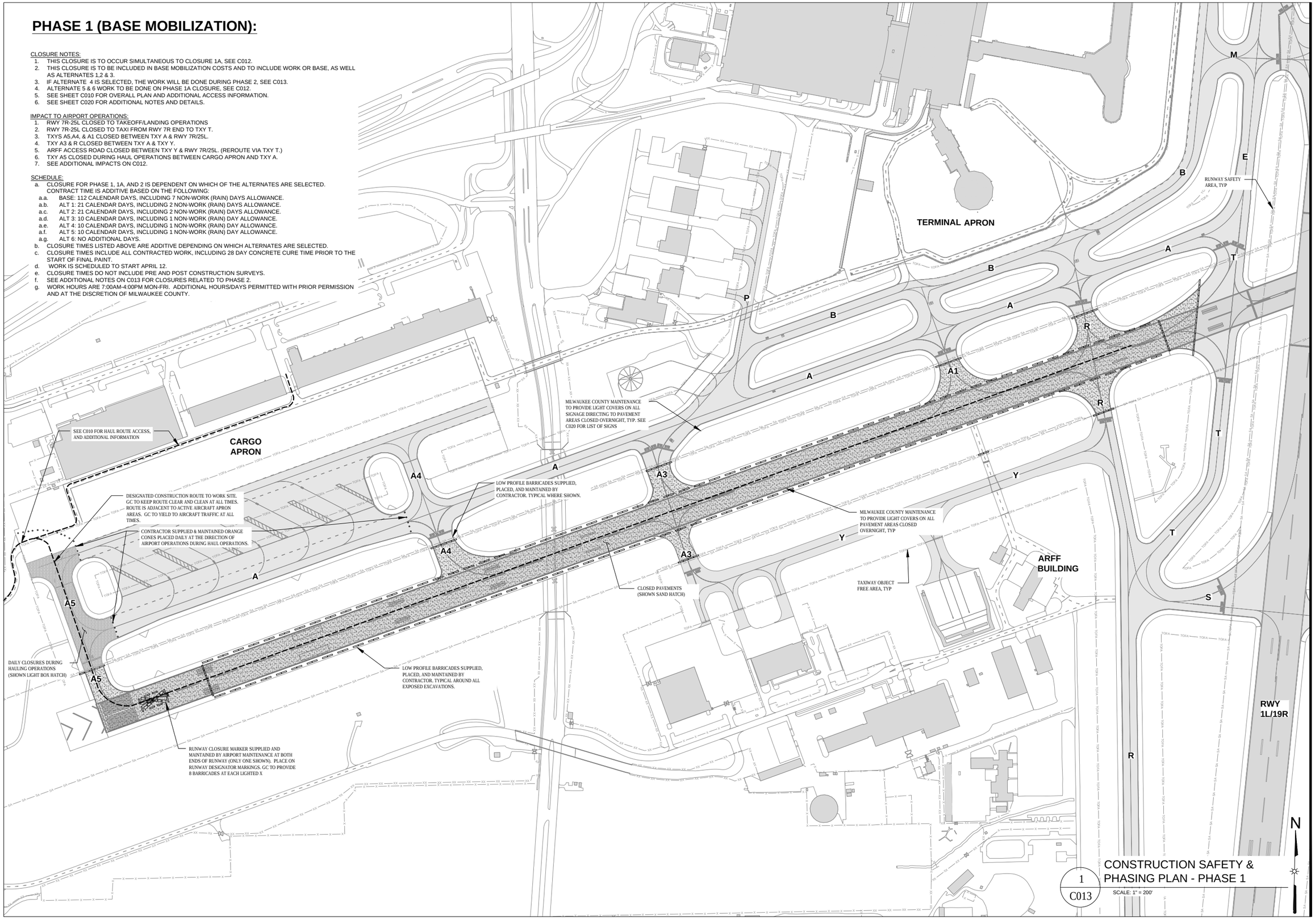
C010

PHASE 1 (BASE MOBILIZATION):

CLOSURE NOTES:
1. THIS CLOSURE IS TO OCCUR SIMULTANEOUS TO CLOSURE 1A. SEE C012.
2. THIS CLOSURE IS TO BE INCLUDED IN BASE MOBILIZATION COSTS AND TO INCLUDE WORK OR BASE, AS WELL AS ALTERNATES 1,2 & 3.
3. IF ALTERNATE 4 IS SELECTED, THE WORK WILL BE DONE DURING PHASE 2, SEE C013.
4. ALTERNATE 5 & 6 WORK TO BE DONE ON PHASE 1A CLOSURE, SEE C012.
5. SEE SHEET C010 FOR OVERALL PLAN AND ADDITIONAL ACCESS INFORMATION.
6. SEE SHEET C020 FOR ADDITIONAL NOTES AND DETAILS.

IMPACT TO AIRPORT OPERATIONS:
1. RWY 7R-25L CLOSED TO TAKEOFF/LANDING OPERATIONS
2. RWY 7R-25L CLOSED TO TAXI FROM RWY 7R END TO TXY T.
3. TXYS A5,A4, & A1 CLOSED BETWEEN TXY A & RWY 7R/25L.
4. TXY A3 & R CLOSED BETWEEN TXY A & TXY Y.
5. ARFF ACCESS ROAD CLOSED BETWEEN TXY Y & RWY 7R/25L. (REROUTE VIA TXY T.)
6. TXY A5 CLOSED DURING HAUL OPERATIONS BETWEEN CARGO APRON AND TXY A.
7. SEE ADDITIONAL IMPACTS ON C012.

SCHEDULE:
a. CLOSURE FOR PHASE 1, 1A, AND 2 IS DEPENDENT ON WHICH OF THE ALTERNATES ARE SELECTED. CONTRACT TIME IS ADDITIVE BASED ON THE FOLLOWING:
   - a.a. BASE: 112 CALENDAR DAYS, INCLUDING 7 NON-WORK (RAIN) DAYS ALLOWANCE.
   - a.b. ALT 1: 21 CALENDAR DAYS, INCLUDING 2 NON-WORK (RAIN) DAYS ALLOWANCE.
   - a.c. ALT 2: 21 CALENDAR DAYS, INCLUDING 2 NON-WORK (RAIN) DAYS ALLOWANCE.
   - a.d. ALT 3: 10 CALENDAR DAYS, INCLUDING 1 NON-WORK (RAIN) DAY ALLOWANCE.
   - a.e. ALT 4: 10 CALENDAR DAYS, INCLUDING 1 NON-WORK (RAIN) DAY ALLOWANCE.
   - a.f. ALT 5: 10 CALENDAR DAYS, INCLUDING 1 NON-WORK (RAIN) DAY ALLOWANCE.
   - a.g. ALT 6: NO ADDITIONAL DAYS.
b. CLOSURE TIMES LISTED ABOVE ARE ADDITIVE DEPENDING ON WHICH ALTERNATES ARE SELECTED.
c. CLOSURE TIMES INCLUDE ALL CONTRACTED WORK, INCLUDING 28 DAY CONCRETE CURE TIME PRIOR TO THE START OF FINAL PAINT.
d. WORK IS SCHEDULED TO START APRIL 12.
e. CLOSURE TIMES DO NOT INCLUDE PRE AND POST CONSTRUCTION SURVEYS.
f. SEE ADDITIONAL NOTES ON C013 FOR CLOSURES RELATED TO PHASE 2.
g. WORK HOURS ARE 7:00AM-4:00PM MON-FRI. ADDITIONAL HOURS/DAYS PERMITTED WITH PRIOR PERMISSION AND AT THE DISCRETION OF MILWAUKEE COUNTY.



1 C013

CONSTRUCTION SAFETY & PHASING PLAN - PHASE 1

SCALE: 1" = 200'

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
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CONSTRUCTION SAFETY & PHASING PLAN - PHASE 1

C011

PHASE 1A (BASE MOBILIZATION):

CLOSURE NOTES:
1. THIS CLOSURE IS TO OCCUR SIMULTANEOUS TO CLOSURE 1, SEE C011.
2. IF ALTERNATE 5 AND/OR ALTERNATE 6 ARE NOT SELECTED, CLOSURE AREA WILL BE ADJUSTED AND BARRICADES LOCATED AT DIFFERENT LOCATIONS.
3. THIS CLOSURE IS TO BE INCLUDED IN BASE MOBILIZATION COSTS, AND TO INCLUDE WORK FOR ALTERNATES 5 & 6.
4. SEE SHEET C010 FOR OVERALL PLAN AND ADDITIONAL ACCESS INFORMATION.
5. SEE SHEET C020 FOR ADDITIONAL NOTES AND DETAILS.

IMPACT TO AIRPORT OPERATIONS:
1. RWY 7R-25L AND RWY 1R-19L CLOSED TO TAKEOFF/LANDING OPERATIONS.
2. RWY 7R-25L CLOSED TO TAXI FROM RWY 1L-19R TO RWY 25L END.
3. RWY 1R-19L CLOSED TO TAXI FROM TXY M TO TXY W.
4. TXY N CLOSED BETWEEN TXY M & 128TH APRON.
5. CLOSED DURING HAUL OPERATIONS ONLY:
   -RWY 13-31 CLOSED TO TAKEOFF/LANDING OPERATIONS.
   -RWY 13-31 CLOSED TO TAXI BETWEEN RWY 19R AND TXY N.
   -RWY 1R-19L CLOSED TO TAXI BETWEEN TXY K & RWY 7R-25L.
   -TXY M BETWEEN 19R & TXY N.
   -TXY N BETWEEN TXY M & RWY 13-31.
   -TXY H BETWEEN TXY J & TXY K.
   -TXY K BETWEEN RWY 1L-19R & TXY H.
6. SEE ADDITIONAL IMPACTS ON C011.

SCHEDULE:
a. SEE SHEET C011 FOR SCHEDULE/CONTRACT DURATION INFORMATION.

NORTH EAST HANGARS

SEE C010 FOR CONTINUATION, HAUL ROUTE ACCESS, AND ADDITIONAL INFORMATION

CONTRACTOR SUPPLIED & MAINTAINED ORANGE CONES PLACED DAILY AT THE DIRECTION OF AIRPORT OPERATIONS DURING HAUL OPERATIONS.

AIRPORT FIELD GATE (NON-SIDA) TO BE PROPPED OPEN BY AIRPORT OPERATIONS DAILY DURING HAUL OPERATIONS.

RUNWAY CLOSURE MARKER SUPPLIED AND MAINTAINED BY AIRPORT MAINTENANCE AT BOTH ENDS OF RUNWAY. PLACE ON RUNWAY DESIGNATOR MARKINGS. GC TO PROVIDE 8 BARRICADES AT EACH LIGHTED X

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

DESIGNATED CONSTRUCTION ROUTE TO WORK SITE. GC TO KEEP ROUTE CLEAR AND CLEAN AT ALL TIMES. ROUTE IS ON ACTIVE AIRCRAFT APRON AREAS. GC TO YIELD TO AIRCRAFT TRAFFIC AT ALL TIMES.

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

TXY OBJECT FREE AREA, TYP.

CONTRACTOR SUPPLIED & MAINTAINED ORANGE CONES PLACED DAILY AT THE DIRECTION OF AIRPORT OPERATIONS DURING HAUL OPERATIONS, TYP.

ONLY PLACED DAYTIME DURING HAULING OPERATIONS:
RUNWAY CLOSURE MARKER SUPPLIED AND MAINTAINED BY AIRPORT MAINTENANCE AT BOTH ENDS OF RUNWAY, PLACE ON 31 DESIGNATOR MARKING AND OUTSIDE TXY C/F OFA AT RWY 13 END. (ONLY ONE SHOWN).

DAILY CLOSURES DURING HAULING OPERATIONS (SHOWN LIGHT BOX HATCH).

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

RUNWAY SAFETY AREA, TYP.

LOW PROFILE BARRICADES SUPPLIED, PLACED, AND MAINTAINED BY CONTRACTOR. TYPICAL AROUND ALL EXPOSED EXCAVATIONS.

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

MILWAUKEE COUNTY MAINTENANCE TO PROVIDE LIGHT COVERS ON ALL SIGNAGE DIRECTING TO PAVEMENT AREAS CLOSED OVERNIGHT, TYP. SEE C020 FOR LIST OF SIGNS.

RUNWAY CLOSURE MARKER SUPPLIED AND MAINTAINED BY AIRPORT MAINTENANCE AT BOTH ENDS OF RUNWAY (ONLY ONE SHOWN). PLACE ON RUNWAY DESIGNATOR MARKINGS. GC TO PROVIDE 8 BARRICADES AT EACH LIGHTED X.

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

LOW PROFILE BARRICADES SUPPLIED, PLACED, AND MAINTAINED BY CONTRACTOR. TYPICAL WHERE SHOWN.

SIGN POST 3. GC TO PLACE & REMOVE EACH HAULING DAY.

CLOSED PAVEMENTS (SHOWN SAND HATCH)

GC TO PROVIDE ADDITIONAL 100' OF BARRICADES PAST RUNWAY EDGE ON EACH SA EDGE, EACH SIDE OF RUNWAY

SEE INSET DETAIL

SEE MAIN PLAN

CLOSED PAVEMENTS (SHOWN SAND HATCH)

LOW PROFILE BARRICADES SUPPLIED, PLACED, AND MAINTAINED BY CONTRACTOR. TYPICAL WHERE SHOWN.

RUNWAY CLOSURE MARKER SUPPLIED AND MAINTAINED BY AIRPORT MAINTENANCE AT BOTH ENDS OF RUNWAY. PLACE OUTSIDE TXY S OFA. GC TO PROVIDE 8 BARRICADES AT EACH LIGHTED X.

RWY 13/31

RWY 1L/19R

RWY 7R/25L

RWY 1R/19L

128TH AIR NATIONAL GUARD APRON

TERMINAL APRON

N

1 / C013 CONSTRUCTION SAFETY & PHASING PLAN - PHASE 1A

SCALE: 1" = 200'

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE, SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE, MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

CONSTRUCTION SAFETY & PHASING PLAN - PHASE 1A

C012

PHASE 2 (ALT 4 MOBILIZATION):

CLOSURE NOTES:

1. THE WORK FOR ALT 4, IF ALTERNATE 4 IS SELECTED, SHALL OCCUR IN THIS CLOSURE.
2. THE COST OF THIS CLOSURE AS SHOWN IS TO BE INCLUDED IN ALTERNATE 4 MOBILIZATION, EXCEPT AS NOTED BELOW.
3. IF ALTERNATE 4 IS NOT SELECTED, THIS CLOSURE EXISTS, EXCEPT ALL BARRICADES EAST OF TXY R ARE TO BE REPLACED W/ CONTRACTOR SUPPLIED CONES ON A DAILY BASIS TO ALLOW FOR MARKING & MARKING REMOVAL. THE COST FOR THIS CONES AND DAILY CLOSURE TO BE PART OF BASE MOBILIZATION.
4. NO WORK IN TXY R CAN OCCUR UNTIL ALL WORK IS DONE IN TXY T. (THIS INCLUDED MARKING REMOVAL & MARKING IF ALT 4 IS NOT SELECTED OR PAVEMENT REMOVAL,REPLACEMENT, CURE TIME, ETC IF ALT 4 IS SELECTED.)
5. SEE SHEET C010 FOR OVERALL PLAN AND ADDITIONAL ACCESS INFORMATION.
6. SEE SHEET C020 FOR ADDITIONAL NOTES AND DETAILS.

IMPACT TO AIRPORT OPERATIONS:

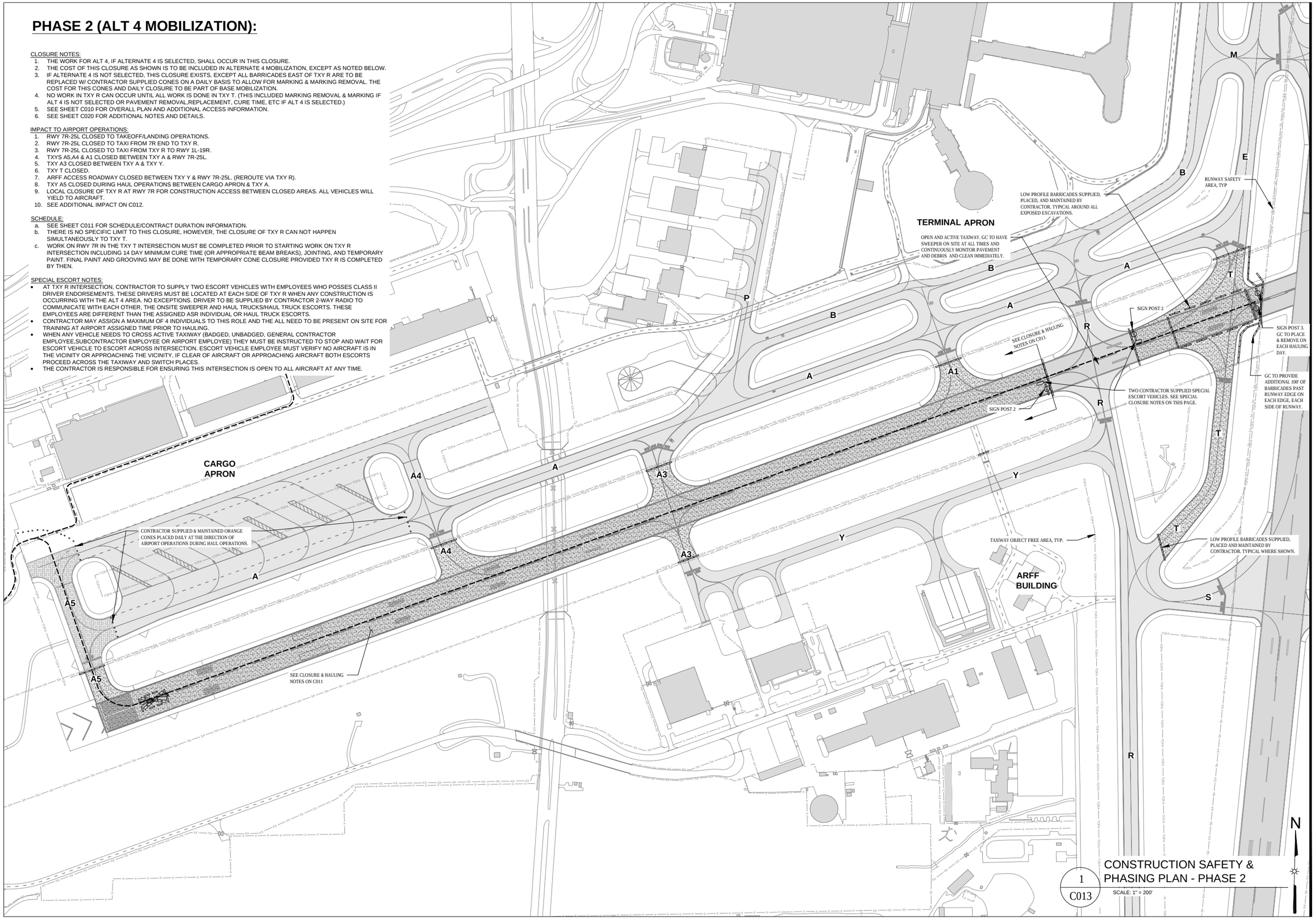
1. RWY 7R-25L CLOSED TO TAKEOFF/LANDING OPERATIONS.
2. RWY 7R-25L CLOSED TO TAXI FROM 7R END TO TXY R.
3. RWY 7R-25L CLOSED TO TAXI FROM TXY R TO RWY 1L-19R.
4. TXYS A5,A4 & A1 CLOSED BETWEEN TXY A & RWY 7R-25L.
5. TXY A3 CLOSED BETWEEN TXY A & TXY Y.
6. TXY T CLOSED.
7. ARFF ACCESS ROADWAY CLOSED BETWEEN TXY Y & RWY 7R-25L. (REROUTE VIA TXY R).
8. TXY A5 CLOSED DURING HAUL OPERATIONS BETWEEN CARGO APRON & TXY A.
9. LOCAL CLOSURE OF TXY R AT RWY 7R FOR CONSTRUCTION ACCESS BETWEEN CLOSED AREAS. ALL VEHICLES WILL YIELD TO AIRCRAFT.
10. SEE ADDITIONAL IMPACT ON C012.

SCHEDULE:

a. SEE SHEET C011 FOR SCHEDULE/CONTRACT DURATION INFORMATION.
b. THERE IS NO SPECIFIC LIMIT TO THIS CLOSURE, HOWEVER, THE CLOSURE OF TXY R CAN NOT HAPPEN SIMULTANEOUSLY TO TXY T.
c. WORK ON RWY 7R IN THE TXY T INTERSECTION MUST BE COMPLETED PRIOR TO STARTING WORK ON TXY R INTERSECTION INCLUDING 14 DAY MINIMUM CURE TIME (OR APPROPRIATE BEAM BREAKS). JOINTING, AND TEMPORARY PAINT. FINAL PAINT AND GROOVING MAY BE DONE WITH TEMPORARY CONE CLOSURE PROVIDED TXY R IS COMPLETED BY THEN.

SPECIAL ESCORT NOTES:

- AT TXY R INTERSECTION, CONTRACTOR TO SUPPLY TWO ESCORT VEHICLES WITH EMPLOYEES WHO POSSES CLASS II DRIVER ENDORSEMENTS. THESE DRIVERS MUST BE LOCATED AT EACH SIDE OF TXY R WHEN ANY CONSTRUCTION IS OCCURRING WITH THE ALT 4 AREA. NO EXCEPTIONS. DRIVER TO BE SUPPLIED BY CONTRACTOR 2-WAY RADIO TO COMMUNICATE WITH EACH OTHER, THE ONSITE SWEEPER AND HAUL TRUCKS/HAUL TRUCK ESCORTS. THESE EMPLOYEES ARE DIFFERENT THAN THE ASSIGNED ASR INDIVIDUAL OR HAUL TRUCK ESCORTS.
- CONTRACTOR MAY ASSIGN A MAXIMUM OF 4 INDIVIDUALS TO THIS ROLE AND THE ALL NEED TO BE PRESENT ON SITE FOR TRAINING AT AIRPORT ASSIGNED TIME PRIOR TO HAULING.
- WHEN ANY VEHICLE NEEDS TO CROSS ACTIVE TAXIWAY (BADGED, UNBADGED, GENERAL CONTRACTOR EMPLOYEE,SUBCONTRACTOR EMPLOYEE OR AIRPORT EMPLOYEE) THEY MUST BE INSTRUCTED TO STOP AND WAIT FOR ESCORT VEHICLE TO ESCORT ACROSS INTERSECTION. ESCORT VEHICLE EMPLOYEE MUST VERIFY NO AIRCRAFT IS IN THE VICINITY OR APPROACHING THE VICINITY, IF CLEAR OF AIRCRAFT OR APPROACHING AIRCRAFT BOTH ESCORTS PROCEED ACROSS THE TAXIWAY AND SWITCH PLACES.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THIS INTERSECTION IS OPEN TO ALL AIRCRAFT AT ANY TIME.



1 C013

CONSTRUCTION SAFETY & PHASING PLAN - PHASE 2

SCALE: 1" = 200'

RUNWAY 7R-25L PAVEMENT REHABILITATION
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REVISIONS:

DATE: 05/04/2020
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CONSTRUCTION SAFETY & PHASING PLAN - PHASE 2

C013

AIRPLANE DESIGN GROUP (ADG)

Group #	Tail Height (ft)	Wingspan (Ft)	MKE Taxiway*	MWC Taxiway*	Sample Aircraft
I	X < 20'	< 49'	N/A	Taxilanes between T-Hangars **	Piper Meridian, TBM700, Beechjet-400, CJ-1
II	20' ≤ X < 30'	49' ≤ X < 79'	D1, F (E of 19R), F1, F2, H, J, K (E of 19R), P	All Taxiways	CJ=2, PC-12, CRJ-700, G-IV, ERJ-145
III	30' ≤ X < 45'	79' ≤ X < 118'	F (13-Z), B (R-A1), R5 (west of R)		B717, B737, A320, ERJ-170
IV	45' ≤ X < 60'	118' ≤ X < 171'	B (V-R), B (A1 - A), Z, Cargo Ramp TaxiLane		A300, A310, MD10, MD11, B767
V	60' ≤ X < 66'	171' ≤ X < 214'	All Remaining		A330, A340, B747, B777
VI	66' ≤ X < 80'	214' ≤ X < 262'	Special Routings		B747-8, A380, An 124, An 225

*Under normal operating conditions.
**Includes Some taxilanes at FBO Ramp

Source: AC 150/5300-13A; Table 1-2
For general guidance only. Always verify with airport operations prior to planning, design of construction.

RUNWAY PROTECTION AREAS (RSA / ROFA / OFZ)

Runway	Runway Pavement Dimensions	Runway Safty Area (RSA)*	Runway Object Free Area (ROFA)*	Runway Obstacle Free Zone (ROFZ)*
MKE: 1L-19R	9990 ft x 200 ft	500 ft (250 ft to each side) 1000 ft extension at both ends	800 ft (400 ft to each side) 1000 ft extension at both ends	400 ft (200 ft to each side) 200 ft extension at both ends
MKE: 7R-25L	8300 ft x 150 ft	500 ft (250 ft to each side) 1000 ft extension at both ends	800 ft (400 ft to each side) 1000 ft extension at both ends	400 ft (200 ft to each side) 200 ft extension at both ends
MKE: 13-31	5538 ft x 150 ft	150 ft (75 ft to each side) 300 ft extension at both ends	500 ft (250 ft to each side) 300 ft extension at both ends	400 ft (200 ft to each side) 200 ft extension at both ends
MKE: 7L-25R	4800 ft x 100 ft	150 ft (75 ft to each side) 300 ft extension at both ends	500 ft (250 ft to each side) 300 ft extension at both ends	400 ft (200 ft to each side) 200 ft extension at both ends
MKE: 1R-19L	4183 ft x 150 ft	500 ft (250 ft to each side) 1000 ft extension at both ends	800 ft (400 ft to each side) 1000 ft extension at both ends	400 ft (200 ft to each side) 200 ft extension at both ends
MWC: 15L-33R	4103 ft x 75 ft	150 ft (75 ft to each side) 300 ft extension at both ends	500 ft (250 ft to each side) 300 ft extension at both ends	250 ft (125 ft to each side)** 200 ft extension at both ends
MWC: 4L-22R	3201 ft x 75 ft	150 ft (75 ft to each side) 300 ft extension at both ends	500 ft (250 ft to each side) 300 ft extension at both ends	250 ft (125 ft to each side)** 200 ft extension at both ends
MWC: 15R-33L (TURF)	3231 ft x 270 ft	270 ft (135 ft to each side) 240 ft extension at both ends	270 ft (135 ft to each side) 240 ft extension at both ends	250 ft (125 ft to each side)** 200 ft extension at both ends
MWC: 4R-22L (TURF)	2839 ft x 270 ft	270 ft (135 ft to each side) 240 ft extension at both ends	270 ft (135 ft to each side) 240 ft extension at both ends	250 ft (125 ft to each side)** 200 ft extension at both ends

*Under normal operating conditions.
**ALP Published width is 250 ft. Drawings and Hold Short Markings are Concentrated around 400 ft. Contact airport operations for specific instructions if construction activity needs to occur between the 250 ft and 400 ft distances.

Sources: MKE and MWC ALP
For general guidance only. Always verify with airport operations prior to planning, design of construction.

TAXIWAY AND TAXILANE PROTECTION AREAS (TSA / TOFA)

Group #	Taxiway/Taxilane Safty Area (TSA)	Taxiway Object Free Area (TOFA)	Taxilane Object Free Area (TOFA)	MKE Taxiway*	MWC Taxiway*
I	49 ft	89 ft	79 ft	N/A	Taxilanes between T-Hangars **
II	79 ft	131 ft	115 ft	D1, F (E of 19R), F1, F2, H, J, K (E of 19R), P	All Taxiways
III	118 ft	186 ft	162 ft	F (13-Z), B (R-A1), R5 (west of R)	
IV	171 ft	259 ft	225 ft	B (V-R), B (A1-A), Z, Cargo Ramp TaxiLane	
V	214 ft	320 ft	276 ft	All Remaining	
VI	262 ft	386 ft	334 ft	Special Routings	

*Under normal operating conditions.
**Includes Some taxilanes at FBO Ramp

Source: AC 150/5300-13A; Table 4-1
For general guidance only. Always verify with airport operations prior to planning, design of construction.

NAVAIDS

Runway	County Owned	FAA Owned	Runway	County Owned	FAA Owned	Project Impact
MKE: 1L	PAPI	In Pavement Threshold Lights	MKE: 19R	PAPI	In Pavement Threshold Lights	N/A
MKE: 7R	PAPI		MKE: 25L	REIL	PAPI	OFF FOR CLOSURE
MKE: 13	REIL	PAPI	MKE: 31	REIL	PAPI	OFF FOR DAILY CLOSURE, IF REQUIRED.
MKE: 7L	REIL	VASI	MKE: 25R	REIL		N/A
MKE: 1R		REIL	MKE: 19L			OFF FOR CLOSURE
MKE: Misc	Wind Cones Airport Beacon In Pavement Sensors In Pavement Lighting					N/A
MWC: 15L	REIL	Localizer VASI	MWC: 33R	REIL	VASI	N/A
MWC: 4L	REIL	VASI	MWC: 22R	REIL	VASI	N/A
MWC: 15R (TURF)			MWC: 33L (TURF)			N/A
MWC: 4R (TURF)			MWC: 22L (TURF)			N/A
MWC: Misc	Wind Cones Airport Beacon In Pavement Sensors					N/A

CONSTRUCTION SAFETY AND PHASING - GENERAL NOTES:

1. THIS PROJECT INVOLVES CONSTRUCTION ON AN AIRFIELD WITH ADJACENT ACTIVE RUNWAYS, TAXIWAYS, AND APRONS. CONTINUOUS COMMUNICATION AND COORDINATION WITH MILWAUKEE COUNTY AIRPORT OPERATIONS AND ENGINEERING IS MANDATORY. ALL OPEN RUNWAY, TAXIWAY AND APRON PAVEMENTS ADJACENT TO THE CONSTRUCTION SITE, HAUL ROUTES, AND STAGING AREAS MUST BE MAINTAINED AND CLEAR OF PERSONNEL, EQUIPMENT, MATERIALS, AND DEBRIS AT ALL TIMES.
2. ACCESS TO THE PROJECT SHALL BE VIA THE GATES AND ROUTES SHOWN. CONTRACTOR SHALL STUDY THESE ROUTES, AND VERIFY THEIR ABILITY TO WITHSTAND THE REQUIRED CONSTRUCTION TRAFFIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING AND RESTORING ANY AREA DAMAGED BY CONSTRUCTION TRAFFIC.
3. IF CONSTRUCTION OCCURS OFF PAVEMENT AREA, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL NON-PAVED AREAS DAMAGED BY CONSTRUCTION ACTIVITIES.
4. CONTRACTOR SHALL KEEP ALL CONSTRUCTION AREAS, HAUL ROUTES, AND ANY STAGING AREAS FREE OF DUST, DIRT, GRAVEL, MUD, OR DEBRIS AND CORRECT ANY CONDITIONS WHICH WOULD CAUSE HAZARDS, UNSIGHTLY APPEARANCES, OR NUISANCE TO THE SATISFACTION OF MILWAUKEE COUNTY AIRPORT OPERATIONS AND ENGINEERING FOR THE DURATION OF THE PROJECT. CONTRACTOR SHALL WATER HAUL ROUTE AND CONSTRUCTION AREA AS REQUIRED TO CONTROL DUST. REFER TO THE SPECIFICATIONS AND CSPP FOR MORE INFORMATION.
5. BARRICADES SHALL BE PLACED AS SHOWN ON PLAN AND SHALL CONFORM TO FAA AC 150/5370-2 (CURRENT EDITION). BARRICADES SHALL BE SET CONTINUOUSLY INTERLOCKED.
6. CONTRACTOR SHALL MAKE THEMSELVES AWARE OF ALL EXISTING UTILITIES EXTENDING INTO AND THROUGH THE CONSTRUCTION AREA, HAUL ROUTES, AND ANY STAGING AREAS. UTILITIES SHALL BE PROTECTED FOR THE DURATION OF THE PROJECT.
7. AVAILABILITY OF RUNWAY AND TAXIWAY CLOSURES IS SUBJECT TO CHANGE BASED ON WEATHER, SAFETY, AND OTHER TECHNICAL MATTERS. CONTRACTOR TO REFERENCE SPECIAL PROVISIONS CONCERNING WORK AREA AVAILABILITY.
8. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS REGARDING THE USE OF ANY DESIGNATED CONSTRUCTION STAGING AREAS. UPON COMPLETION OF THE PROJECT ANY STAGING AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION.
9. SEE CONSTRUCTION SAFETY AND PHASING PLAN FOR ADDITIONAL NOTES, DETAILS, AND PROVISIONS.
10. CONTRACTOR MUST CALL DIGGERS HOTLINE PRIOR TO ALL CONSTRUCTION.
11. SEE CSPP FOR NAVAID INFORMATION AND NOTIFICATION REQUIREMENTS.

LIST OF SIGNS TO OBSCURE:

1. MILWAUKEE COUNTY TO OBSCURE THE FOLLOWING SIGNS:
   1.1. ANY TAXIWAY DIRECTIONAL ARROW POINTING TO CLOSED AREA (ARROW ONLY, NOT TAXIWAY LETTER)
   1.2. ANY DESTINATION DIRECTIONAL SIGN DIRECTING TRAFFIC ALONG A CLOSED ROUTE

PHASE 1:
SIGN 205 (ARROW ONLY)
SIGN 210 (ARROW ONLY)
SIGN 218 (ARROW ONLY)
SIGN 221 (ARROW ONLY)
SIGN 214 (ARROW ONLY)
SIGN 241 (ARROW ONLY)
SIGN 248 (ARROW ONLY)
SIGN 244 (ARROW ONLY)

PHASE 1A:
SIGN 618 (ARROW ONLY)

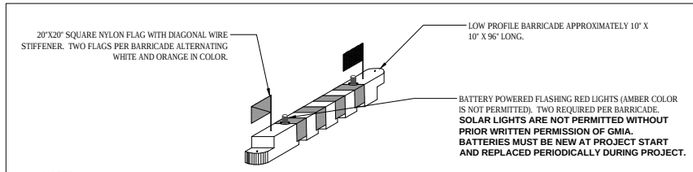
PHASE 2:
SIGN 205 (ARROW ONLY)
SIGN 210 (ARROW ONLY)
SIGN 218 (ARROW ONLY)
SIGN 221 (ARROW ONLY)
SIGN 214 (ARROW ONLY)
SIGN 349 (ARROW ONLY)
SIGN 347 (ARROW ONLY)
SIGN 348 (ARROW ONLY)
SIGN 323 (ARROW ONLY)
SIGN 545 (ARROW ONLY)

BADGING AND ESCORTING NOTES:
SEE PROJECT MANUAL AND WRITTEN CSPP AND OTHER BADGING AND ESCORTING NOTES. BELOW IS A SUMMARY OF THIS INFORMATION.

1. ALL CONSTRUCTION EQUIPMENT OPERATORS (GENERAL OR SUBCONTRACTOR) MUST HAVE CURRENT AIRPORT ISSUED BADGES WITH CLASS II DRIVING ENDORSEMENTS OR BE ESCORTED BY CONTRACTOR SUPPLIED INDIVIDUAL WHO IS BADGED. THE AIRPORT WILL NOT PROVIDE THIS ESCORT.
2. ALL CONSTRUCTION LAORERS (GENERAL OR SUBCONTRACTOR) NOT OPERATING EQUIPMENT MUST HAVE CURRENT AIRPORT ISSUED BADGE OR BE ESCORTED BY CONTRACTOR SUPPLIED INDIVIDUAL WHO IS BADGED. THE AIRPORT WILL NOT PROVIDE THIS ESCORT.
3. ALL DAILY HAUL DRIVERS MUST HAVE A CURRENT AIRPORT ISSUED BADGE WITH CLASS II DRIVING ENDORSEMENT OR BE ESCORTED BY CONTRACTOR SUPPLIED INDIVIDUAL WHO IS BADGED. CONTRACTOR MAY ESCORT 3 TRUCKS IN ONE TRIP, BUT ALL 3 HAUL TRUCKS MUST STAY TOGETHER. THE AIRPORT WILL NOT PROVIDE HAUL VEHICLE ESCORTS. THIS IS ,MANDATORY FOR ALL HAUL TRUCK AT ALL TIMES.
4. CONTRACTOR OR SUBCONTRACTOR SUPPLIED INDIVIDUALS WHO ARE ESCORTING THOSE WITHOUT BADGES MUST BE IN THE IMMEDIATE VICINITY OF THOSE THEY ARE ESCORTING AND MUST HAVE VISUAL CONTACT AT ALL TIMES. THE ESCORT INDIVIDUAL CAN NOT BE ACTIVELY INVOLVED IN OTHER MANUAL LABOR WORK OR OTHER ACTIVITY THAT COULD DISTRACT THE INDIVIDUAL. ON HAUL ROUTES, THIS INDIVIDUAL MUST SERVE AS A "FOLLOW ME" ESCORT AND CAN NOT BE STATIONARY.
5. ON PHASE 2 WORK DAYS, THE CONTRACTOR SHALL SUPPLY AN ADDITIONAL ESCORT INDIVIDUAL WHO MUST REMAIN AT THE TXY R INTERSECTION AT ALL TIMES WHILE WORK IS OCCURRING BEYOND TXY R. THIS INDIVIDUAL MAY BE THE ASR OR SWEEPER TRUCK, BUT CANNOT BE THE SAME INDIVIDUAL ESCORTING VEHICLES TO/FROM THE GATE OR WITHIN THE WORK ZONE.

AIRFIELD SAFETY REPRESENTATIVE (ASR) REQUIREMENTS:

1. GENERAL CONTRACTOR IS RESPONSIBLE FOR DESIGNATING AN AIRFIELD SAFETY REPRESENTATIVE (ASR) FOR EACH DAY OF WORK ON SITE. THIS INCLUDES DAYS SUBCONTRACTORS ARE ON SITE AND GENERAL CONTRACTOR IS NOT PERFORMING WORK.
2. THE ASR MAY BE ASSIGNED TO DIFFERENT INDIVIDUALS ON DIFFERENT DAYS AND MAY BE AN EMPLOYEE OF A SUBCONTRACTOR
3. THE ASR MAY BE A FOREMAN OR OTHER INDIVIDUAL ENGAGED IN WORK PROVIDED IT DOES NOT INTERFERE WITH THE REQUIREMENTS OF BEING THE ASR.
4. GENERAL CONTRACTOR SHALL SUPPLY THE NAME, TITLE, AND PHONE NUMBER OF THE ASR TO MILWAUKEE COUNTY EACH MORNING PRIOR TO START OF WORK.
5. THE ASR MUST BE ON SITE AT ALL TIMES AND SHALL NOT LEAVE UNTIL WORK AREA IS INSPECTED BY MILWAUKEE COUNTY COORDINATOR.
6. THE ASR SHALL BE FAMILIAR WITH AND HAVE A COPY OF THE PROJECT PLANS, SPECIFICATIONS, CSPP AND SPCD DOCUMENTS ON SITE.
7. THE ASR SHALL HAVE A LIST OF AIRPORT CONTACTS AND EMERGENCY PHONE NUMBERS ON SITE.
8. THE ASR SHALL CHECK IN WITH THE MILWAUKEE COUNTY COORDINATOR AT THE START AND END OF EACH WORK DAY.
9. THE ASR SHALL BE RESPONSIBLE WITH ENSURING ALL INDIVIDUALS WORKING ON SITE ARE FAMILIAR WITH AND ENFORCING THE HAUL ROUTE, WORK AREA LIMITATIONS, AND ALL RULES AND SAFETY REQUIREMENTS.
10. THE ASR SHALL BE RESPONSIBLE FOR COMMUNICATING WITH HAUL TRUCKS AS THEY ARRIVE TO ENSURE THEY ARE FAMILIAR WITH HAUL ROUTE OPERATIONS.
11. THE ASR SHALL BE RESPONSIBLE FOR COORDINATING WITH MILWAUKEE COUNTY THE DAILY WORK PLAN, WORK TIMING, LOCATIONS, ISSUES AND/OR CHANGES THAT ARISE.



NOTES:
1. BARRICADES SHALL CONFORM TO FAA AC 150/5370-2 (CURRENT EDITION)
2. BARRICADES TO BE PLACED ALONG THE LIMITS OF THE PHASES OF WORK, AS SHOWN IN THESE PLANS OR AS DIRECTED BY AIRPORT OPERATIONS, TO DELINEATE PAVEMENTS CLOSED TO AIRCRAFT.
3. BARRICADES SHALL BE COLLAPSIBLE AND HIGHLY REFLECTIVE AND CONSIST OF DIAGONAL ALTERNATING ORANGE AND WHITE STRIPES.
4. BARRICADES SHALL BE NO MORE THAN 18" ABOVE THE GROUND, EXCLUSIVE OF LIGHTS AND FLAGS.
5. BARRICADES SHALL BE WEIGHTED AND DESIGNED SUCH THAT IT IS NOT SUBJECT TO MOVEMENT FROM PROP WASH, JET BLAST, WING VORTEX, OR OTHER SURFACE WIND CURRENTS.
4. BARRICADES MUST BE SUPPLEMENTED WITH FLASHING RED LIGHTS (AMBER IS NOT PERMITTED).
5. BARRICADES MUST BE SUPPLEMENTED WITH ALTERNATING ORANGE AND WHITE FLAGS AT LEAST 20" X 20" SQUARE.
6. FLAGS AND LIGHTS MUST BE SECURELY FASTENED.
7. ALL BARRIERS SHALL BE CHECKED FOR SIGNS OF DAMAGE OR WEAR ON A REGULAR BASIS AND REPLACED AS NEEDED.
8. ALL LIGHT FIXTURES SHALL BE VERIFIED OPERATIONAL BY CONTRACTOR DAILY.
9. CONTRACTOR MUST HAVE AN INDIVIDUAL ON CALL 24-HOURS A DAY FOR EMERGENCY MAINTENANCE OF BARRICADES AND THEIR LIGHTING.
10. COST OF INSTALLATION AND MAINTENANCE OF BARRIERS SHALL BE INCLUDED IN MOBILIZATION.

3 / C020 LOW PROFILE BARRICADE
SCALE: NTS

SIGN POST 1
TWO (2) SIGN POST REQUIRED SUPPLIED, PLACED, MAINTAINED BY GC

[STOP SIGN]
HAUL ROUTE CLOSED
DO NOT PROCEED
(CLOSED SHALL BE IN RED LETTERS)

SIGN POST 1A (SAME AS 1)
TWO (2) SIGN POSTS REQUIRED SUPPLIED, PLACED, MAINTAINED BY GC

[STOP SIGN]
HAUL ROUTE OPEN
FOLLOW ROUTE
YIELD TO ALL AIRCRAFT
(OPEN SHALL BE IN GREEN LETTERS)

SIGN POST 2
TWO (2) SIGN POSTS REQUIRED SUPPLIED, PLACED, MAINTAINED BY GC

[STOP SIGN]
DO NOT PROCEED.
SPECIAL ESCORT REQUIRED BEYOND THIS POINT.

SIGN POST 3
TEN (10) SIGN POSTS REQUIRED SUPPLIED, PLACED, MAINTAINED BY GC

[DO NOT ENTER SIGN]
WARNING: ACTIVE AIRFIELD
NO CONSTRUCTION TRAFFIC BEYOND THIS POINT.

NOTES:
1. SEE C010 - C013 FOR SIGN PLACEMENTS.
2. ALL COSTS ASSOCIATED WITH SIGNAGE TO BE INCLUDED WITH MOBILIZATION.
3. WORDING SHALL BE REVIEWED AND APPROVED BY MILWAUKEE COUNTY PRIOR TO FABRICATION.
4. SIGNPOST 1, 1A & 2 SHALL INCLUDE A STANDARD STOP SIGN AND A RECTANGULAR INFORMATIONAL SIGN BELOW.
5. SIGNPOST 3 SHALL INCLUDE A STANDARD DO NOT ENTER SIGN AND A RECTANGULAR INFORMATIONAL SIGN BELOW.
6. SIGNPOST 1 & 1A ARE THE SAME BASE AND STOP SIGN. SIGN 1A SHALL HAVE A DIFFERENT RECTANGULAR INFORMATION SIGN THAT CAN BE CLIPPED TO THE RECTANGULAR SIGN ON SIGN 1.
7. INFORMATIONAL SIGN ARE BLACK LETTERS ON WHITE, UNLESS NOTED OTHERWISE.
8. ALL SIGNS SHALL BE MOUNTED ON POST SET IN CONCRETE BASE.
9. ALL SIGNS ARE TO BE LEFT WITH MILWAUKEE COUNTY AT END OF PROJECT AND MOVED TO THE MAINTENANCE YARD ON CITATION WAY.

2 / C020 HAUL ROUTE SIGNS
SCALE: NTS

TO OBTAIN LOCATION OF
PARTICIPANTS' UNDERGROUND FACILITIES
BEFORE YOU DIG

DIGGERS HOTLINE™

TOLL FREE 811 OR 1-800-242-8511
EMERGENCY ONLY: 1-877-500-9592
WWW.DIGGERSHOTLINE.COM

WISCONSIN STATUTE 182.0175 (1974)
REQUIRES MINIMUM OF 3 WORKING DAYS
NOTICE BEFORE YOU EXCAVATE

NOTES:
1. MILWAUKEE COUNTY IS A MEMBER OF DIGGERS HOTLINE AND WILL BE NOTIFIED WHEN CONTRACTOR CONTACTS DIGGERS HOTLINE.
2. MILWAUKEE COUNTY WILL NOTIFY FAA WHEN IT RECEIVES NOTICE FROM DIGGERS HOTLINE

1 / C020 DIGGERS HOTLINE
SCALE: NTS

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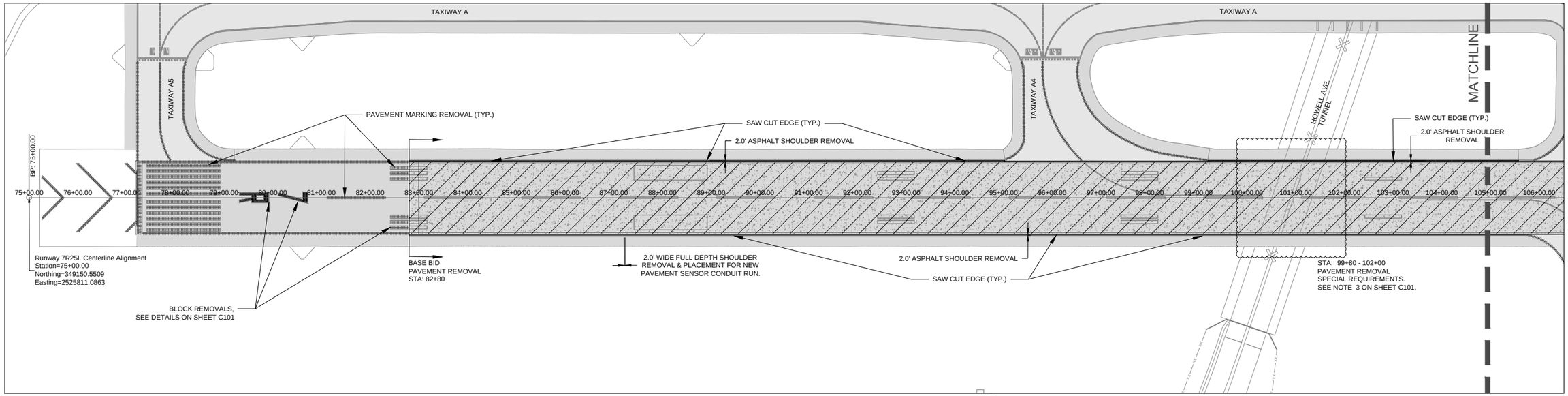
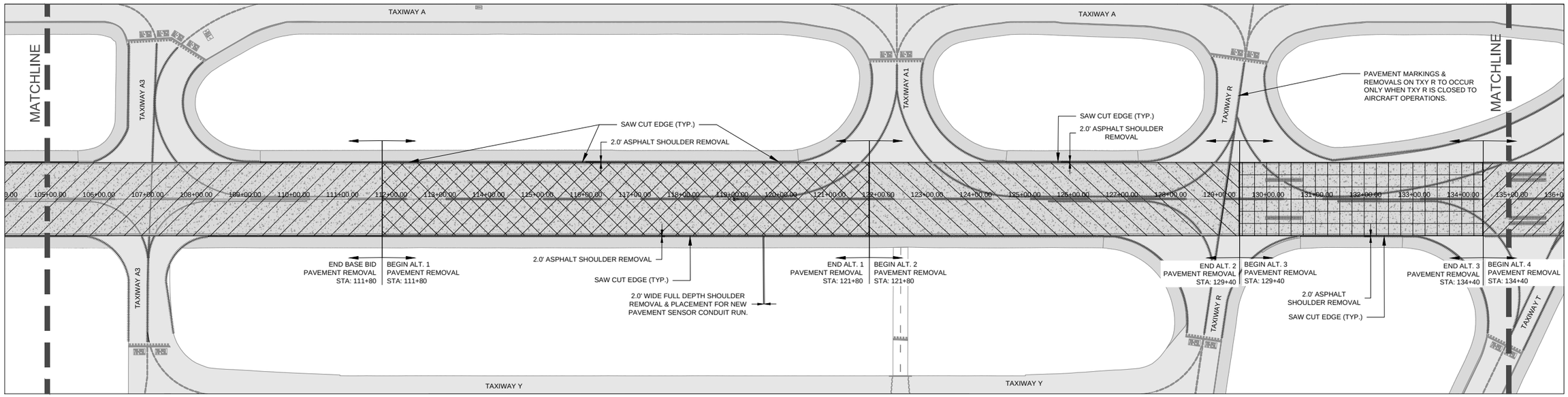
CSPP NOTES & DETAILS
C020



LEGEND

- EXISTING CONCRETE PAVEMENT
- EXISTING ASPHALT PAVEMENT
- EXISTING PAVEMENT MARKING
- BASE BID - PAVEMENT REMOVAL
- ALTERNATE 1 - PAVEMENT REMOVAL
- ALTERNATE 2 - PAVEMENT REMOVAL
- ALTERNATE 3 - PAVEMENT REMOVAL
- ALTERNATE 4 - PAVEMENT REMOVAL
- ALTERNATE 5 - PAVEMENT REMOVAL
- ALTERNATE 6 - PAVEMENT REHABILITATION
- PAVEMENT MARKING REMOVAL



*SEE SHEET C-101 FOR REMOVAL NOTES AND DETAILS

1
C100

EXISTING CONDITIONS AND REMOVALS PLAN

SCALE: 1" = 100'

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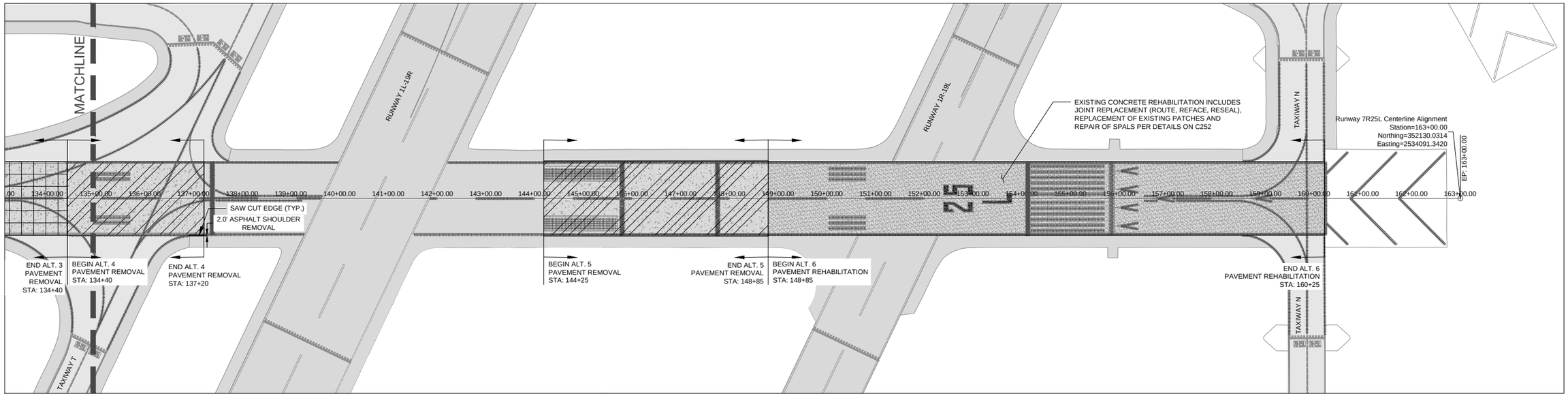
DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

EXISTING CONDITIONS & REMOVALS PLAN

C100

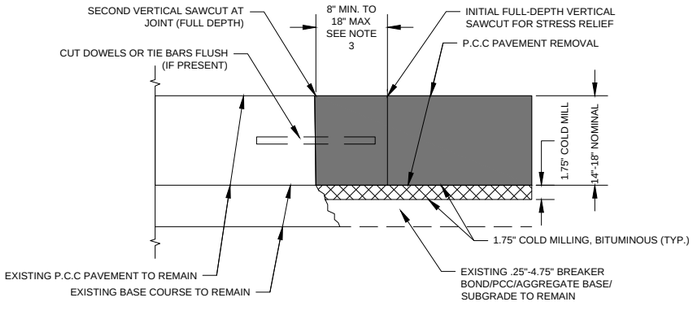


GENERAL REMOVAL NOTES

1. CONTRACTOR MUST TAKE CARE TO PROTECT THE ASPHALT AND CONCRETE LAYER BELOW THE CONCRETE TO BE REMOVED AS WELL AS THE ADJACENT SHOULDER. CONTRACTORS ACTIVITIES THAT DAMAGE PAVEMENT SHALL BE REPAIRED AT NO COST TO THE AIRPORT.
2. ALTERNATES 1,2 & 3, IF AWARDED MAY BE ARRANGED IN A DIFFERENT ORDER THAN DEPICTED ON THE PLANS. ALTERNATES 1,2 & 3, IF AWARDED ARE ASSUMED TO BE ADDED ON TO THE BASE BID LIMITS OF 111+80 AND EXTEND THE LIMITS OF THE PROJECT BY THE LENGTH OF THE ALTERNATES AWARDED. ALTERNATES 4,5 & 6 ARE ASSUMED TO OCCUR AS SHOWN.
3. A PAVEMENT REMOVAL PLAN FOR STA 99+80 - 102+00 MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE REMOVAL PLAN MUST BE DESIGNED TO PROTECT THE HOWELL AVE. TUNNEL BELOW THE PAVEMENT.
4. STATIONING FOR REMOVAL LIMITS IS APPROXIMATE. IF NEEDED, ADJUST REMOVAL LIMITS TO EXISTING PAVEMENT JOINT.
5. ALL SAW CUTTING SHALL BE CONSIDERED INCIDENTAL TO ITEM "PAVEMENT REMOVAL".
6. WHILE 1.75" MILLING IS TYPICAL, MILLING DEPTH SHALL BE ADJUSTED FOR PROPOSED PAVEMENT SECTION TO MATCH PROPOSED FINISHED GRADE WITH EXISTING GRADE.
7. CONCRETE SPALL REPAIR AND SLAB REPLACEMENT FOR ALT 6, TO BE MARKED BY ENGINEER IN FIELD PRIOR TO START OF ALT 6 WORK AREA.
8. GC TO ASSUME EXISTING CONCRETE TO BE REMOVED IS REINFORCED IN 2 DIRECTIONS AND HAS DOWELS ACROSS ALL JOINTS.

PAINT REMOVAL NOTES

1. REMOVAL OF EXISTING PAINT SHALL BE WITH PRESSURIZED WATER AND SHALL NOT EXCESSIVELY DAMAGE PAVEMENT SURFACE.
2. REMOVAL OF EXISTING PAINT WHERE PAINT IS RETURNED TO THE SAME LOCATION, SHALL INCLUDE THE REMOVAL OF AT LEAST 75% OF PAINT. PAINT WHICH IS REMOVED AND RELOCATED SHALL BE 100% REMOVED.
3. EXISTING PAINT REMOVAL SHALL NOT DAMAGE EXISTING JOINTS. ALL JOINTS MUST BE PROTECTED (COVER) DURING REMOVAL.
4. ALL PAINT SHALL ADHERE TO FAA AC 150/5340-1L.

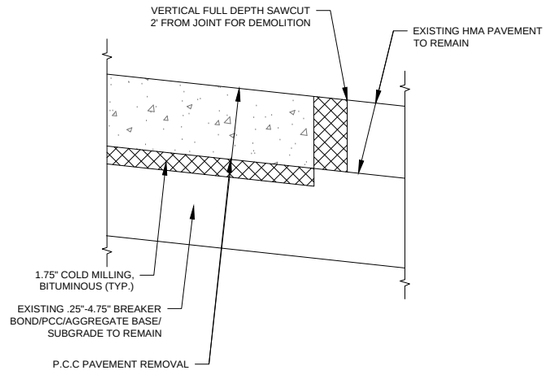


PCC-PCC PAVEMENT REMOVAL DETAIL

NOT TO SCALE

NOTES

1) TWO VERTICAL FULL-DEPTH SAWCUTS SHALL BE MADE AS INDICATED PRIOR TO COMMENCEMENT OF ANY PAVEMENT DEMOLITION.
2) CONTRACTOR SHALL TAKE ACTION AS NEEDED TO PREVENT LOSS OF ANY BASE COURSE TO REMAIN.
2) CONTRACTOR TO DETERMINE DISTANCE FROM JOINT FOR FIRST SAWCUT.
3) ANY PCC PAVEMENT BEYOND LIMITS THAT MAY HAVE BEEN DAMAGED BY CONTRACTOR SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST

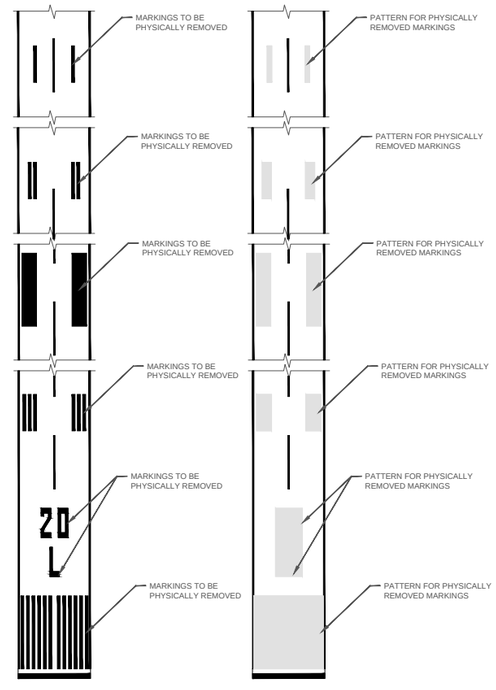


PCC-HMA PAVEMENT REMOVAL DETAIL

NOT TO SCALE

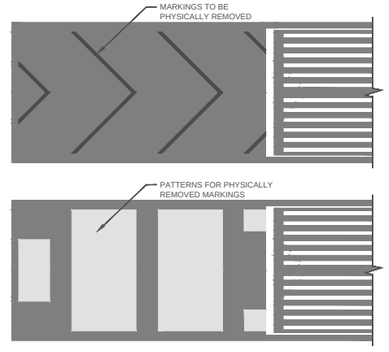
NOTES

1) ANY SHOULDER PAVEMENT BEYOND REMOVAL LIMITS THAT IS DAMAGED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST. EDGE OF SHOULDER REPAIR MUST BE STRAIGHT AND SMOOTH. NO "SAWTOOTH" TO REPAIR SMALL AREAS WILL BE ALLOWED. SAWCUT SHALL BE TAPERED BACK FROM DAMAGED AREAS AT NO MORE THAN 1 INCH PER FOOT. CONSECUTIVE TAPERS WILL NOT BE ALLOWED WITHIN 10 FEET OF EACH OTHER.
2) LOCATIONS AS SHOWN ON DEMOLITION PLANS.
3) VERTICAL FULL-DEPTH SAWCUTS SHALL BE MADE AS INDICATED PRIOR TO COMMENCEMENT OF ANY PAVEMENT DEMOLITION. ADDITIONAL SAWCUT MAY BE NECESSARY TO PROTECT THE BITUMINOUS SHOULDER TO REMAIN. CONTRACTOR TO DETERMINE NECESSARY SAWCUT TO PROTECT ALL PAVEMENT TO REMAIN.
4) CONTRACTOR SHALL TAKE ACTION AS NEEDED TO PREVENT LOSS OF CTB OR BREAKER BOND FROM UNDERNEATH PAVEMENT TO REMAIN IN PLACE.



MARKING REMOVAL EXAMPLE DETAIL

NOT TO SCALE



MARKING REMOVAL EXAMPLE DETAIL

NOT TO SCALE

LEGEND

- EXISTING CONCRETE PAVEMENT
- EXISTING ASPHALT PAVEMENT
- EXISTING PAVEMENT MARKING
- BASE BID - PAVEMENT REMOVAL
- ALTERNATE 1 - PAVEMENT REMOVAL
- ALTERNATE 2 - PAVEMENT REMOVAL
- ALTERNATE 3 - PAVEMENT REMOVAL
- ALTERNATE 4 - PAVEMENT REMOVAL
- ALTERNATE 5 - PAVEMENT REMOVAL
- ALTERNATE 6 - PAVEMENT REHABILITATION
- PAVEMENT MARKING REMOVAL

1 / C101

EXISTING CONDITIONS AND REMOVALS PLAN

SCALE: 1" = 100'

N

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

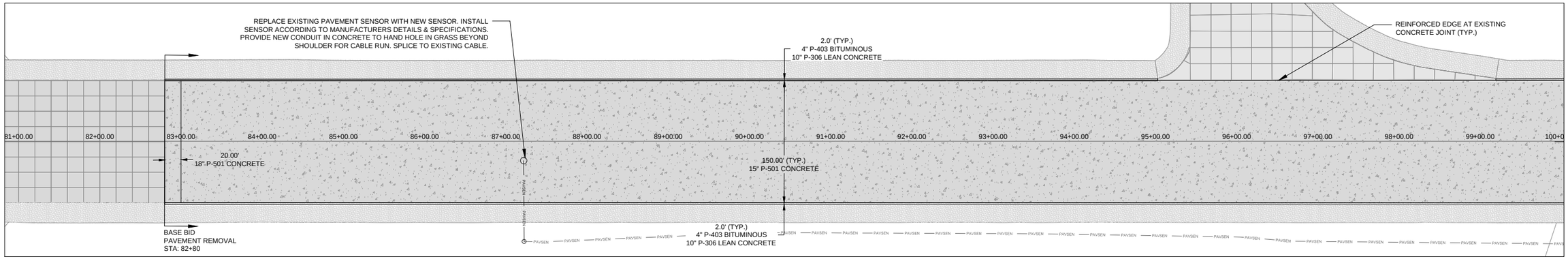
Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE. SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE. MILWAUKEE, WI 53207

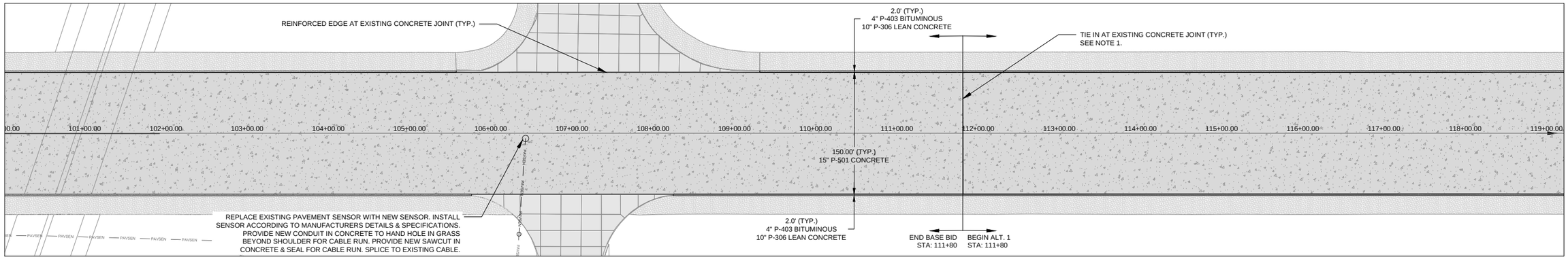
REVISIONS:

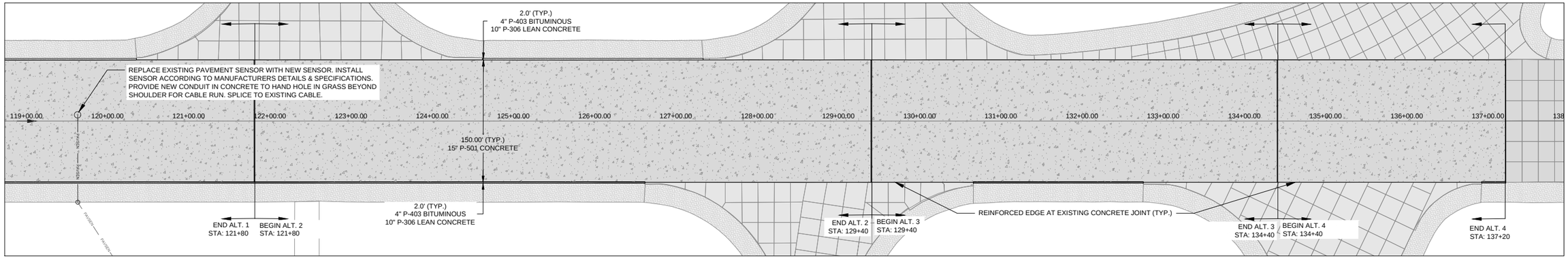
DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

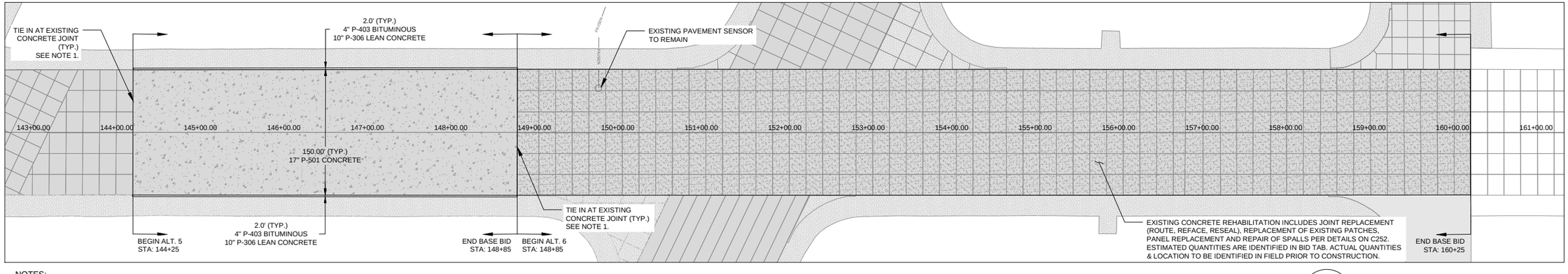
EXISTING CONDITIONS & REMOVALS PLAN

C101









NOTES:
1. THE LIMITS OF THE PROJECT ON THE RUNWAY SHALL BE ADJUSTED TO MATCH THE CLOSEST EXISTING CONCRETE JOINT ON THE RUNWAY.
2. CONTRACTOR TO SURVEY EXISTING PAVEMENT PRIOR TO PAVEMENT REMOVAL. NEW PAVEMENT TO MATCH EXISTING ELEVATION. SEE PSP-22 FOR SURVEY REQUIREMENTS.

1 / C102 PAVEMENT PLAN
SCALE: 1" = 60'

RUNWAY 7R-25L PAVEMENT REHABILITATION
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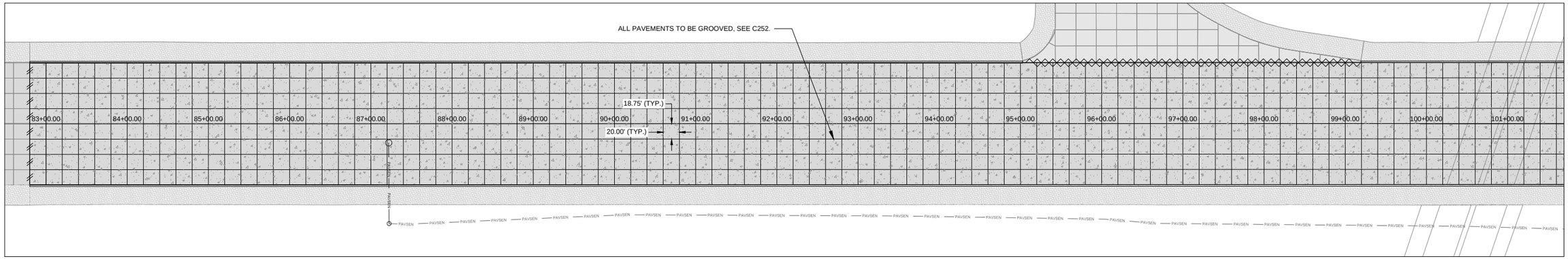
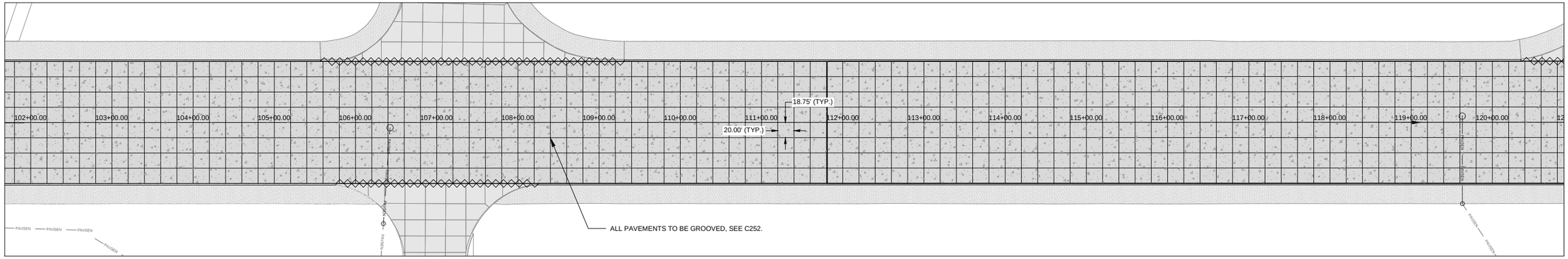
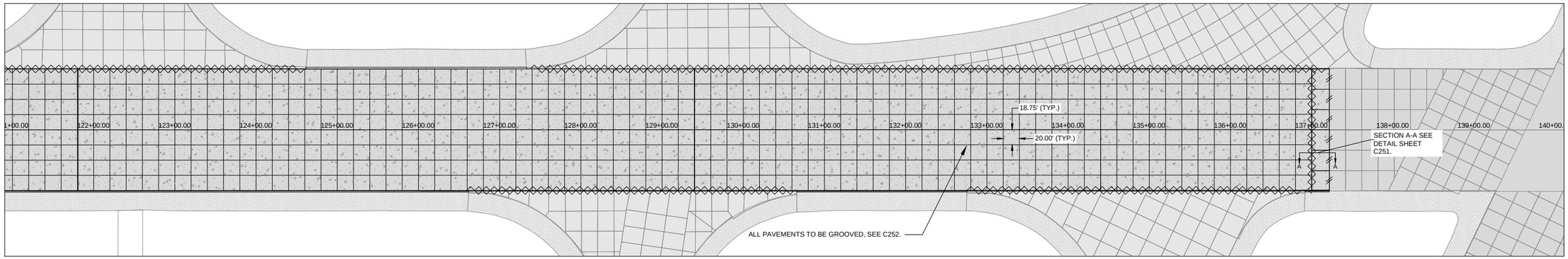
REVISIONS:

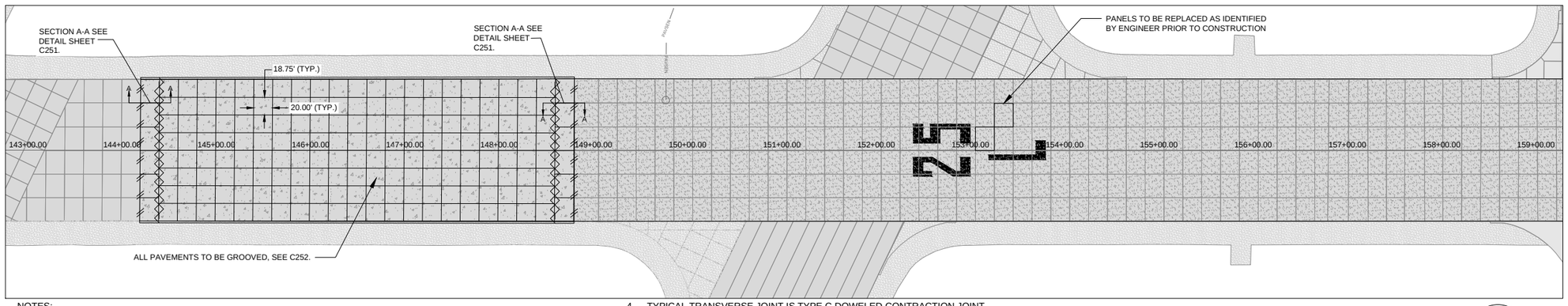
DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

PAVEMENT PLAN
C102









LEGEND

- EXISTING CONCRETE PAVEMENT
- EXISTING ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED REHABILITATION AREA
- TYPE A-1 ISOLATION JOINT
- TYPE E DOWELED CONTRACTION JOINT

NOTES:

1. WHERE PROPOSED CONCRETE IS ADJACENT TO EXISTING CONCRETE, NOT SEPARATED BY AN ISOLATION JOINT, PROPOSED JOINT SPACING SHALL BE ADJUSTED IN THE FIELD TO MATCH THE EXISTING JOINT SPACING.
3. TYPICAL LONGITUDINAL JOINT IS TYPE E DOWELED CONSTRUCTION JOINT.
4. TYPICAL TRANSVERSE JOINT IS TYPE C DOWELED CONTRACTION JOINT.
5. TYPE E PAVEMENT JOINTS SHALL BE PLACED AT THE END OF EACH DAYS PAVING AS NEEDED.
6. SECTION A-A REINFORCED ISOLATION JOINT SHALL BE PLACED AT THE PROJECT LIMITS DEPENDING ON ALTERNATES AWARDED TO THE PROPOSED PCC AND EXISTING RUNWAY SECTION.

1 / C103 PAVEMENT PLAN

SCALE: 1" = 60'

N

RUNWAY 7R-25L PAVEMENT REHABILITATION

GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)

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AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE, MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020

PROJECT: A392-20184

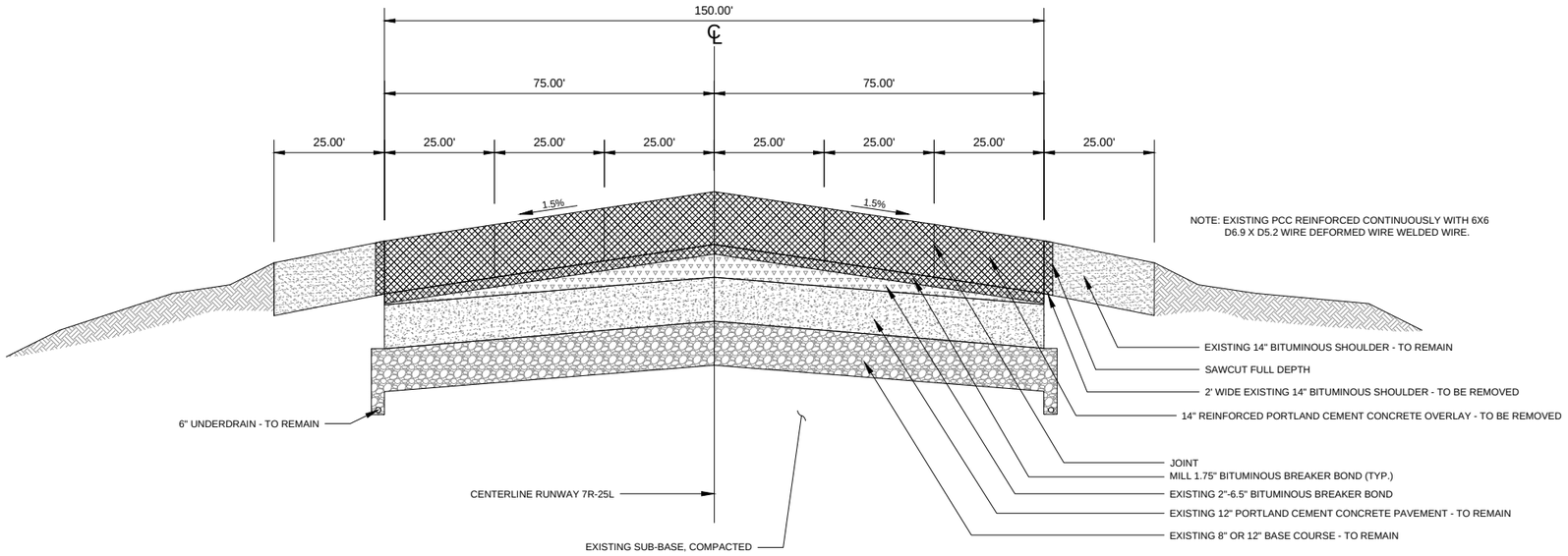
AIP PROJECT # TBD

SITE NO: 290

BUILDING NO: N/A

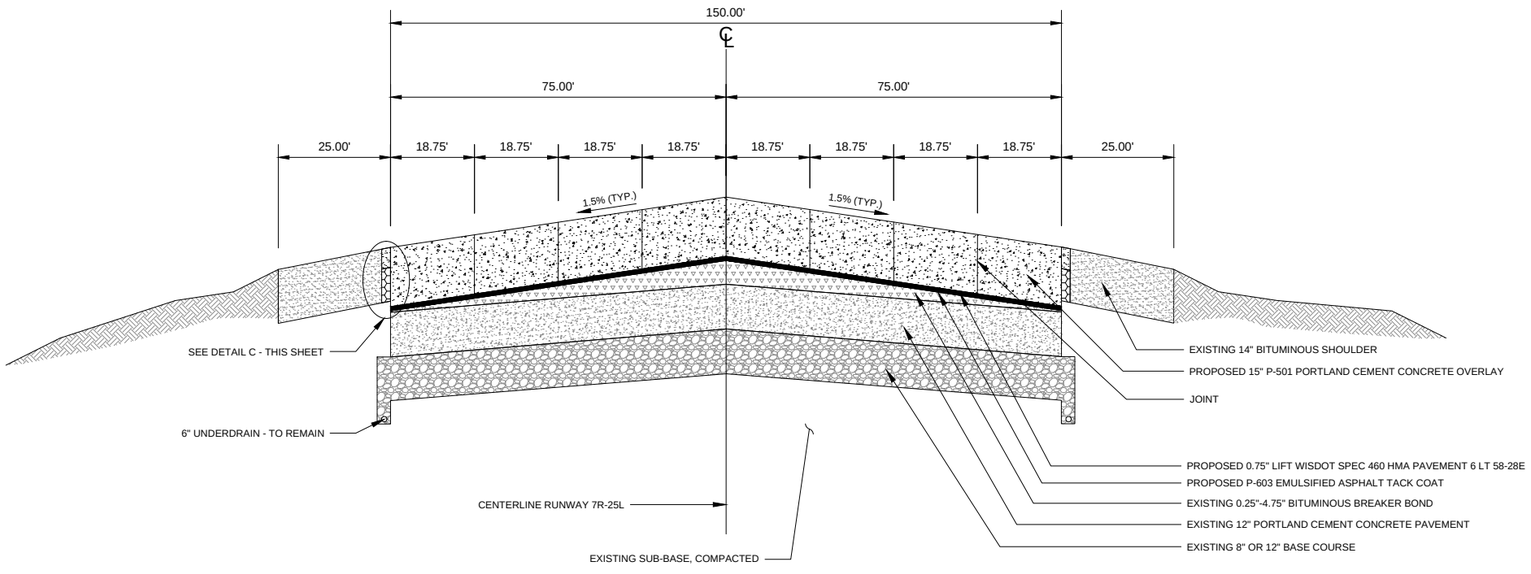
PAVEMENT PLAN

C103



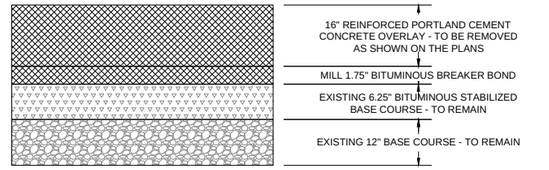
1 EXISTING TYPICAL SECTION AND REMOVALS RUNWAY 7R-25L (BASE BID THRU ALT. 4)

NOT TO SCALE



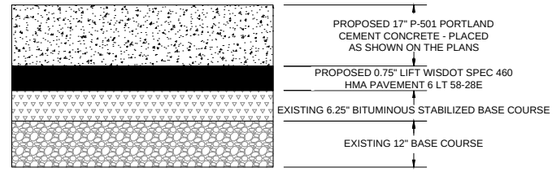
2 PROPOSED TYPICAL SECTION RUNWAY 7R-25L (BASE BID THRU ALT. 4)

NOT TO SCALE



A EXISTING TYPICAL RUNWAY PAVEMENT SECTION (ALT 5 AND 6)

NOT TO SCALE

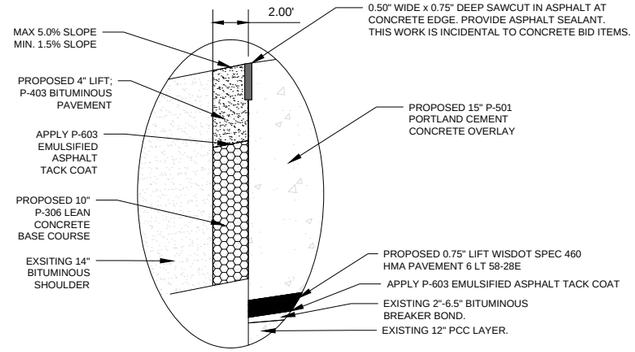


B PROPOSED TYPICAL RUNWAY PAVEMENT SECTION (ALT 5 AND 6)

NOT TO SCALE

LEGEND

- EXISTING CONCRETE PAVEMENT
- EXISTING ASPHALT PAVEMENT
- EXISTING BITUMINOUS BREAKER BOND
- EXISTING EARTH
- EXISTING BASE COURSE
- PAVEMENT REMOVAL/MILLING
- PROPOSED P-501 CONCRETE PAVEMENT
- PROPOSED 0.75" LIFT WISDOT SPEC 460 HMA PAVEMENT 6 LT 58-28E
- PROPOSED P-306 LEAN CONCRETE BASE COURSE
- PROPOSED P-403 BITUMINOUS SURFACE ASPHALT



C RUNWAY PAVEMENT EDGE DETAIL

NOT TO SCALE

1 C250 TYPICAL PAVEMENT SECTIONS

SCALE: N.T.S.

RUNWAY 7R-25L PAVEMENT REHABILITATION

GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)

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REVISIONS:

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PROJECT: A392-20184

AIP PROJECT # TBD

SITE NO: 290

BUILDING NO: N/A

PAVING DETAILS

C250

JOINTING NOTES

1) ALL EDGES OF NEW SLABS, FREE STANDING OR CLOSURE SHALL BE EDGED WITH AN APPROVED TOOL HAVING A RADIUS OF 1/8" TO 1/4" TO FACILITATE SAWING OF THE SEALANT RESERVOIR. A RADIUS > 1/4" WILL NOT BE ACCEPTABLE.

2) THE SAW CUT FOR ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED AS SOON AS POSSIBLE AFTER PLACEMENT OF THE PAVEMENT.

3) ALL DOWEL BARS IN TRANSVERSE JOINTS SHALL BE SECURELY HELD IN PLACE BY MEANS OF A DOWEL BAR ASSEMBLY WHICH WILL INSURE THAT THEY REMAIN PARALLEL TO THE PAVEMENT LANES. SHOP DRAWING SUBMITTAL OF THE DOWEL BAR ASSEMBLIES SHALL BE MADE PRIOR TO INSTALLATION.

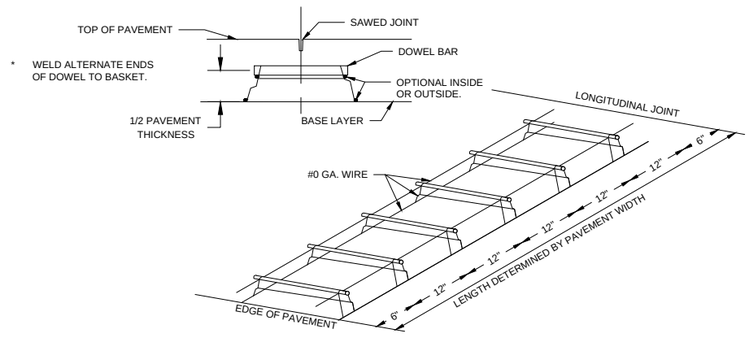
4) ALL REINFORCEMENT AND/OR FABRIC SHALL BE SECURELY HELD IN PLACE BY SUPPORT PINS OR OTHER APPROVED METHODS TO PREVENT SHIFTING DURING & AFTER CONCRETE PLACEMENT.

5) TYPE E DOWELED CONSTRUCTION JOINTS SHALL BE INSTALLED FOR ALL LONGITUDINAL JOINTS AND WHERE PAVING OPERATIONS ARE DELAYED OR STOPPED.

6) DOWEL BARS SHALL BE EPOXY COATED PER MANUFACTURER REQUIREMENTS.

7) RETROFITTING DOWEL BARS INTO EXISTING CONCRETE PAVEMENT SHALL BE CONSIDERED INCIDENTAL TO THE ITEM "PAVEMENT REMOVAL".

THICKNESS OF SLAB	DIAMETER	LENGTH	SPACING
6-7 IN	3/4 IN	18 IN	12 IN
8-12 IN	1 IN	19 IN	12 IN
13-16 IN	1-1/4 IN	20 IN	15 IN
17-20 IN	1-1/2 IN (1)	20 IN	18 IN
21-24 IN	2 IN (1)	24 IN	18 IN

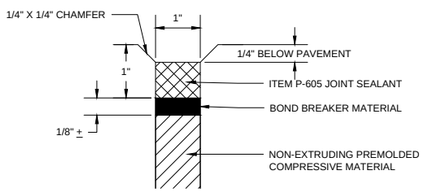


DOWEL BAR ASSEMBLY
NOT TO SCALE

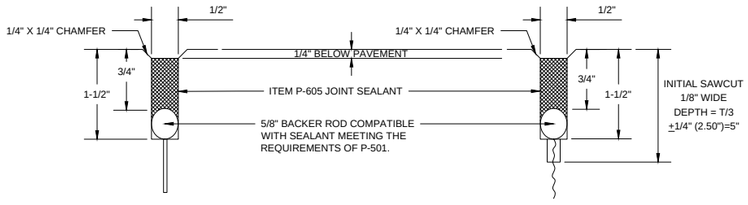
JOINT SEALANT DETAILS

GENERAL NOTES:

1) ALL JOINT SEALANT SHALL BE CONSIDERED INCIDENTAL TO THE ITEM "PORTLAND CEMENT CONCRETE, 15-INCH", "PORTLAND CEMENT CONCRETE, 17-INCH" OR ITEM "PORTLAND CEMENT CONCRETE, 18-INCH" DEPENDING ON LOCATION. THIS INCLUDES THE SEALANT BETWEEN THE PROPOSED CONCRETE AND THE PROPOSED SHOULDER.



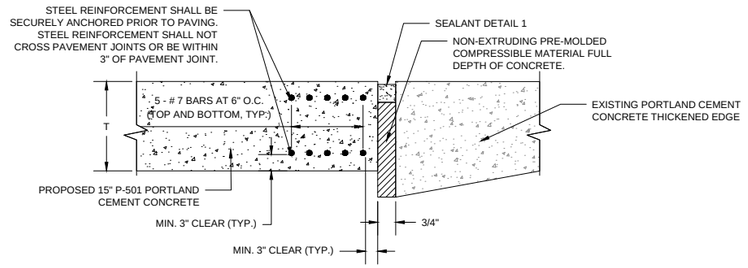
SEALANT DETAIL 1
NOT TO SCALE



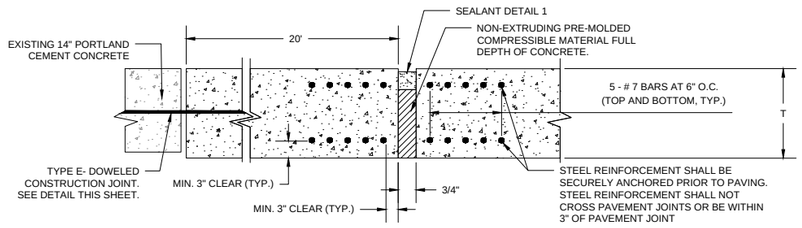
SEALANT DETAIL 2
NOT TO SCALE

SEALANT DETAIL 3
NOT TO SCALE

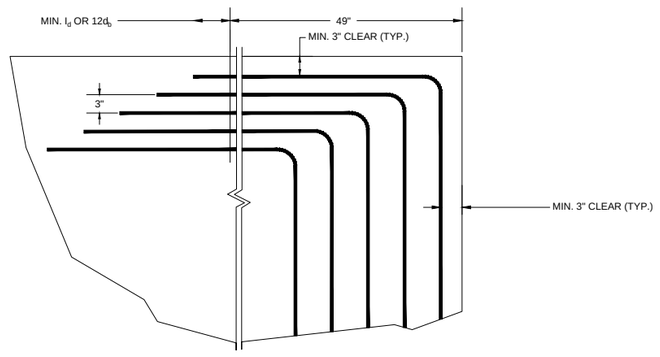
ISOLATION JOINT



TYPE A-1 REINFORCED ISOLATION JOINT (TYPICAL TAXIWAY TIE IN)
NOT TO SCALE

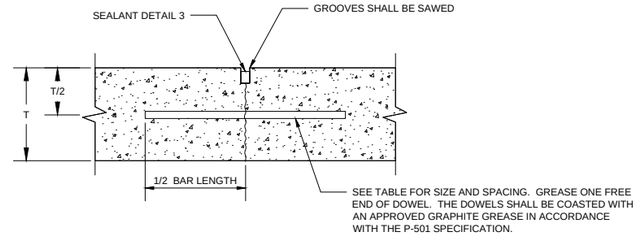


SECTION A-A REINFORCED ISOLATION JOINT
NOT TO SCALE



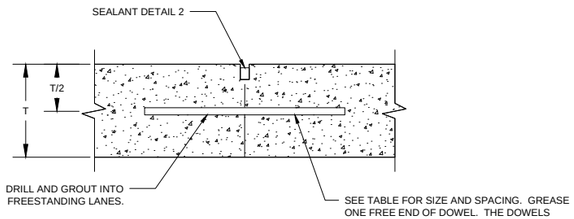
NOTE: REINFORCED ISOLATION JOINT SHALL BE CONSIDERED INCIDENTAL TO THE ITEM "PORTLAND CEMENT CONCRETE, 15-INCH", OR "PORTLAND CEMENT CONCRETE, 17-INCH" DEPENDING ON LOCATION AND ALTERNATE AWARDED.

CONTRACTION JOINT

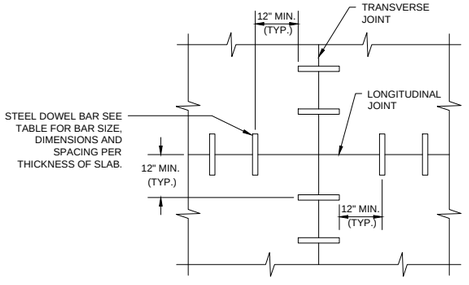


TYPE C - DOWELED
NOT TO SCALE

CONSTRUCTION JOINT



TYPE E - DOWELED
NOT TO SCALE



DOWEL PLACEMENT DETAIL
NOT TO SCALE

PAVING DETAILS (SHEET 1 OF 2)

1 / C251

SCALE: N.T.S.

RUNWAY 7R-25L PAVEMENT REHABILITATION
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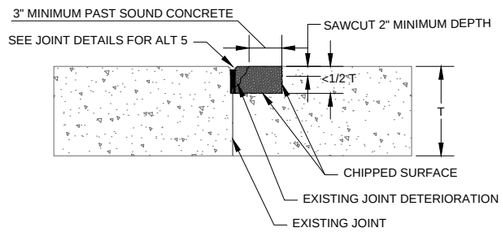
SITE NO: 290
BUILDING NO: N/A

PAVING DETAILS
C251

CONSTRUCTION JOINT SEAL DETAIL - ALT 6

CONCRETE SPALL REPAIR - ALT 6

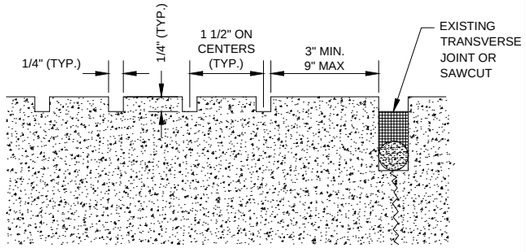
STEP 1:SAW CUT AND CHIP OUT RECTANGULAR PATCH AREA. EXTEND PATCH AREA 3" PAST SOUND CONCRETE IN PLAN, AND EXTEND PATCH DEPTH TO SOUND CONCRETE (2" MINIMUM).
STEP 2:JOINT FILLER NON-ABSORBENT MATERIAL INSTALLED TO TOP OF EXISTING SLAB BEFORE PLACING PATCH MATERIAL.
STEP 3: PLACE PATCH MATERIAL.
STEP 4: ROUTE AND RESET JOINT.



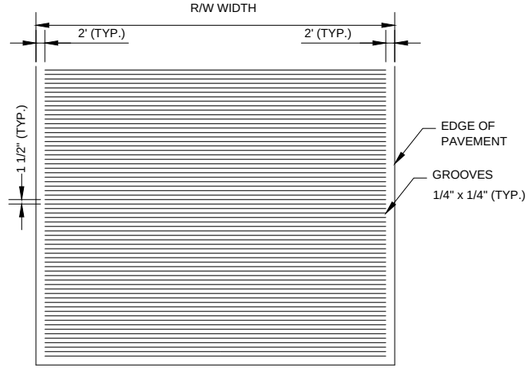
RUNWAY GROOVING DETAIL

NOTE:
GROOVES PARALLEL TO TRANSVERSE JOINTS EXCEPT AS SHOWN. GROOVES MAY BE CONTINUED THROUGH LONGITUDINAL CONSTRUCTION JOINTS.

ALL GROOVING TO BE DONE ACCORDING TO AC 150/5320-12C



RUNWAY GROOVING LAYOUT



PAVING DETAILS (SHEET 2 OF 2)

1
C252

SCALE: N.T.S.

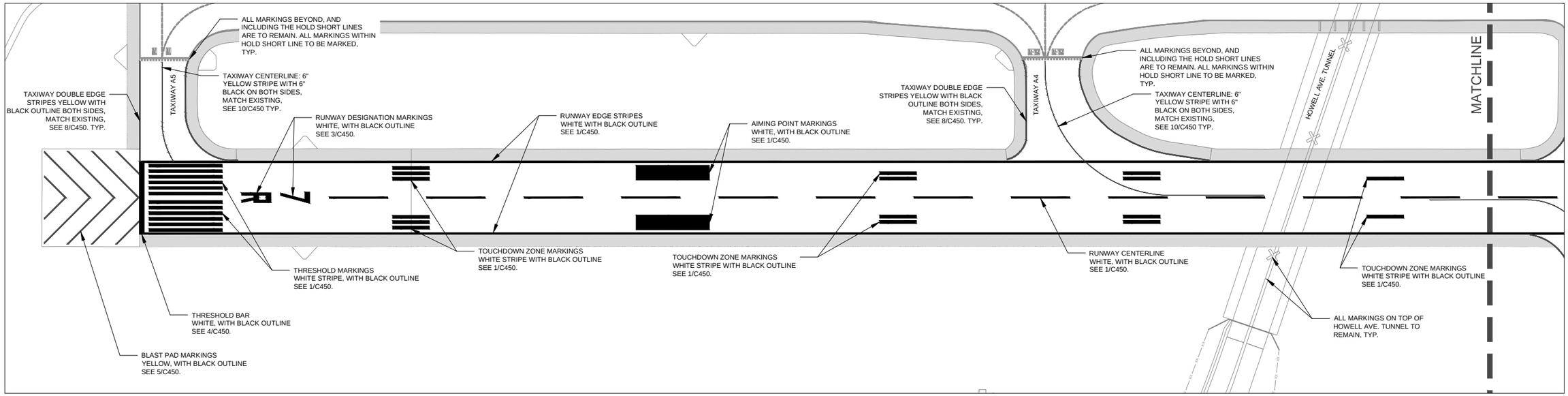
RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE. SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE. MILWAUKEE, WI 53207

REVISIONS:

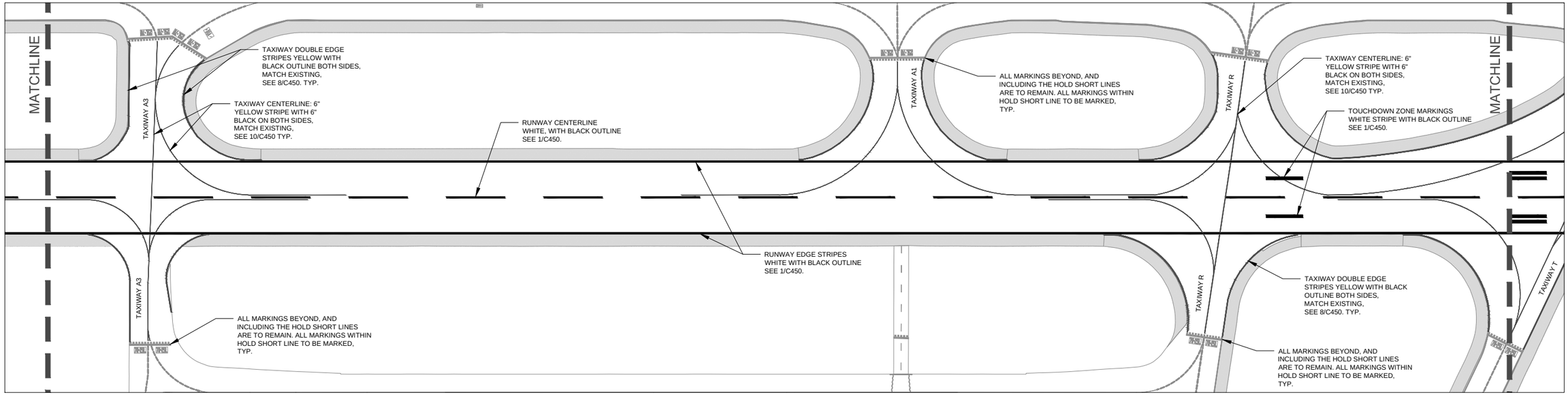
DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT # TBD
SITE NO: 290
BUILDING NO: N/A

PAVING DETAILS
C252



NOTES:
1. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS.
2. CONTRACTOR SHOULD BE FAMILIAR WITH ITEM P-620 AND FOLLOW ALL MARKING REQUIREMENTS.
3. CONTRACTOR SHOULD BE FAMILIAR WITH MARKING DIMENSIONS AND SPACING TOLERANCE.

1 / C400 PAVEMENT MARKING PLAN
SCALE: 1" = 100'



2 / C400 PAVEMENT MARKING PLAN
SCALE: 1" = 100'

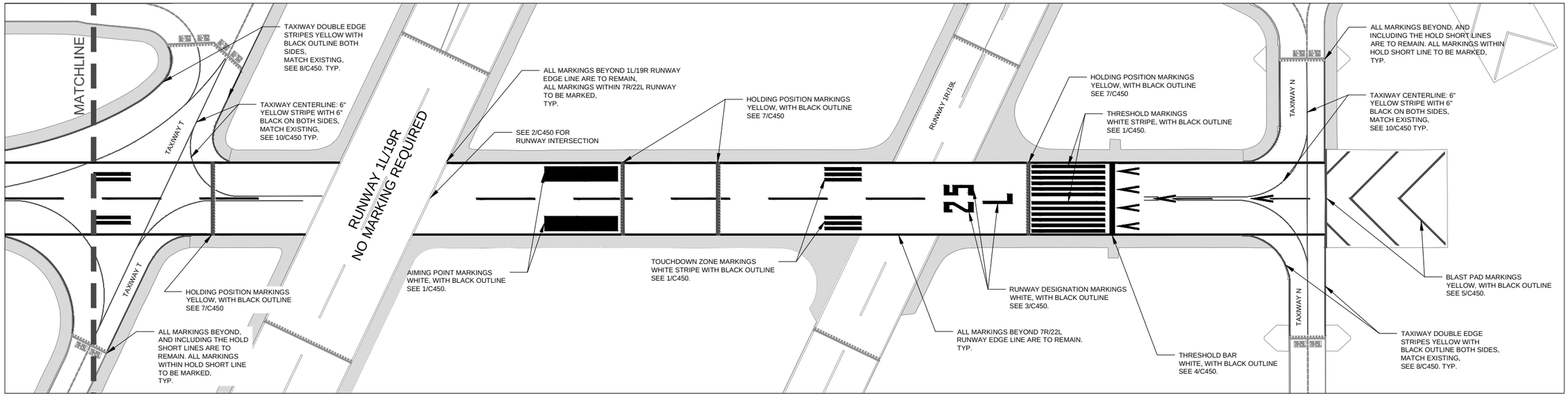
RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE. SUITE 800; MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE; MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

PAVEMENT MARKING PLAN
C400



NOTES:
1. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS.
2. CONTRACTOR SHOULD BE FAMILIAR WITH ITEM P-620 AND FOLLOW ALL MARKING REQUIREMENTS.
3. CONTRACTOR SHOULD BE FAMILIAR WITH MARKING DIMENSIONS AND SPACING TOLERANCE.

1 / C401 PAVEMENT MARKING PLAN

SCALE: 1" = 100'

N

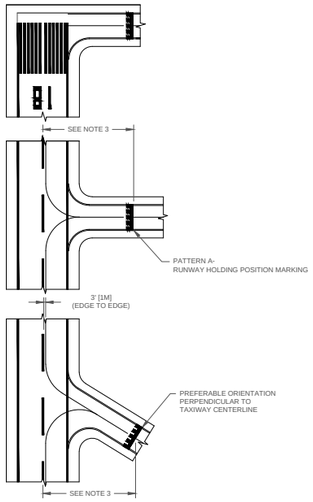
RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE. SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE, MILWAUKEE, WI 53207

REVISIONS:

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

PAVEMENT MARKING PLAN
C401

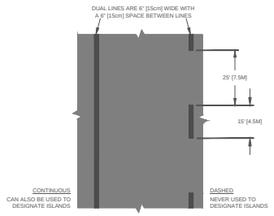


NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS.
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. MARKINGS ON THIS FIGURE ARE MIXED YELLOW AND WHITE (WITH BLACK OUTLINE).

12 / C450

MARKING - TAXIWAY MARKINGS

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-16)



TAXIWAY EDGE MARKINGS - 2 CASES

NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS .
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. UNLESS NOTED OTHERWISE, ALL MARKINGS ON THIS FIGURE ARE YELLOW (WITH BLACK OUTLINE).

8 / C450

MARKING - TAXIWAY MARKINGS

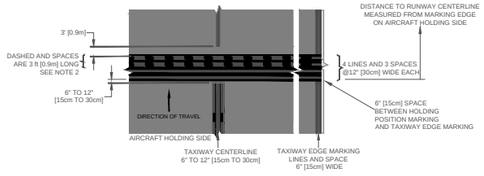
SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-15)

NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS.

11 / C450

MARKING - TAXIWAY EDGE LINE

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-16)



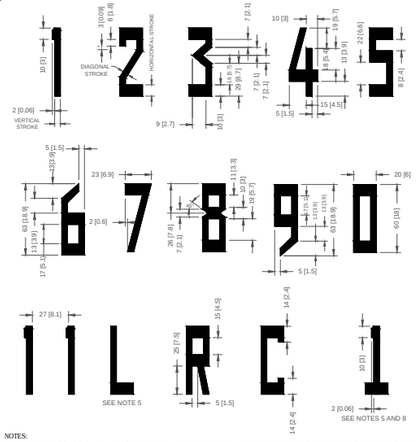
RUNWAY HOLDING POSITION MARKING

NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS.
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. UNLESS NOTED OTHERWISE, ALL MARKINGS ON THIS FIGURE ARE YELLOW (WITH BLACK OUTLINE).

7 / C450

MARKING - HOLDING POSITION

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-13)

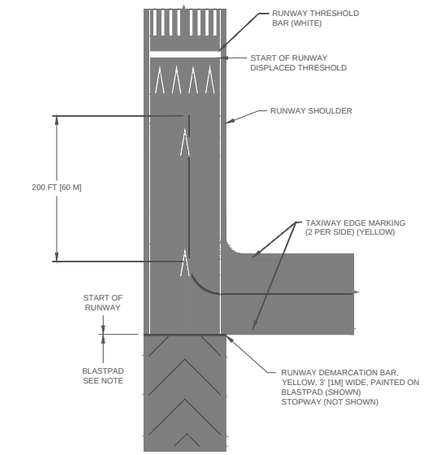


NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS - SEE 7/C402 AND 8/C402 FOR SAMPLE.
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. UNLESS NOTED OTHERWISE, ALL MARKINGS IN THIS FIGURE ARE WHITE (WITH BLACK OUTLINE).
5. ALL CHARACTERS HAVE THESE CHARACTERISTICS (UNLESS NOTED OTHERWISE):
   - 5.1. 60 [18] HIGH
   - 5.2. 20 [6] WIDE
   - 5.3. VERTICAL STROKE OF 5 [1.5]
   - 5.4. HORIZONTAL STROKE OF 10[3]
   - 5.5. DIAGONAL STROKE OF 5 [1.5]
6. ALL NUMBERS EXCEPT THE NUMBER ELEVEN AS SHOWN ARE HORIZONTALLY SPACED 15 [4.5] APART
7. SINGLE DIGITS MUST NOT BE PRECEDED BY A ZERO.
8. THE NUMERAL "1", WHEN USED ALONE, CONTAINS A HORIZONTAL STROKE, AS SHOWN, TO DIFFERENTIATE IT FROM THE RUNWAY CENTERLINE MARKING.
9. SINGLE DESIGNATIONS ARE CENTERED ON THE RUNWAY PAVEMENT CENTERLINE. FOR DOUBLE DESIGNATIONS, THE CENTER OF THE OUTER EDGE OF THE TWO NUMERALS IS CENTERED ON THE RUNWAY PAVEMENT CENTERLINE.
10. WHERE THE RUNWAY DESIGNATION CONSIST OF A NUMBER AND A LETTER, THE NUMBER AND LETTER ARE LOCATED ON THE RUNWAY CENTERLINE IN A STACKED ARRANGEMENT AS SHOWN IN1/C402.

3 / C450

MARKING - RUNWAY DESIGNATION

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-6)

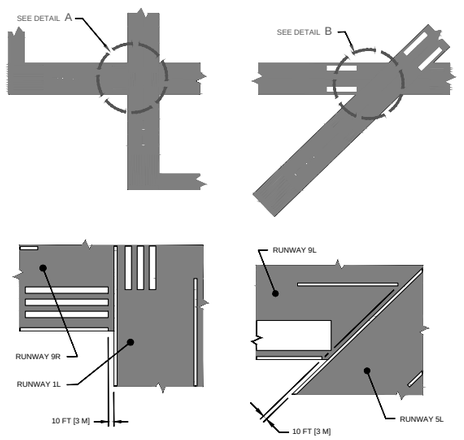


NOTES:
1. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS.
2. STOPWAYS WIDTH EQUALS RUNWAY WIDTH.
3. BLAST PAD WIDTH EQUALS RUNWAY WIDTH PLUS RUNWAY SHOULDERS.

6 / C450

MARKING - BLAST PAD PRECEDING A DISPLACED THRESHOLD

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-11)

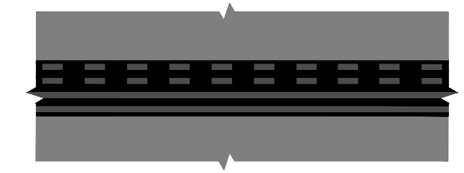


NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. UNLESS NOTED OTHERWISE, ALL MARKINGS ON THIS FIGURE ARE WHITE (WITH BLACK OUTLINE).

2 / C450

MARKING - INTERSECTING RUNWAYS

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-5)

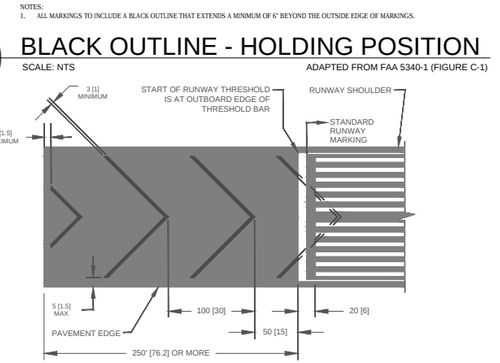


NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS.

10 / C450

BLACK OUTLINE - TAXIWAY CENTERLINE

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE C-6)



NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS.

9 / C450

BLACK OUTLINE - HOLDING POSITION

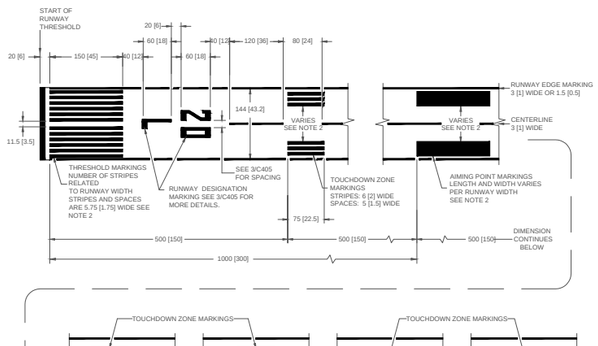
SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE C-1)

NOTES:
1. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS.
3. 50 ft [15m] SPACING MUST BE USED WHEN LENGTH OF AREA IS LESS THAN 250 ft [76m] IN WHICH CASE THE FIRST FULL CHEVRON STARTS AT THE INDEX POINT (INTERSECTION OF RUNWAY CENTERLINE AND RUNWAY THRESHOLD).
4. CHEVRONS ARE PAINTED YELLOW AND AT AN ANGLE OF 45° OF THE RUNWAY CENTERLINE.
5. FOR STOPWAYS OF LESS THAN 250 ft [76m] IN LEGTH, FULL CHEVRONS ARE REQUIRED WITH THE OPTION TO PAINT PARTIAL CHEVRONS.

5 / C450

MARKING - BLAST PADS & STOPWAYS

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-9)

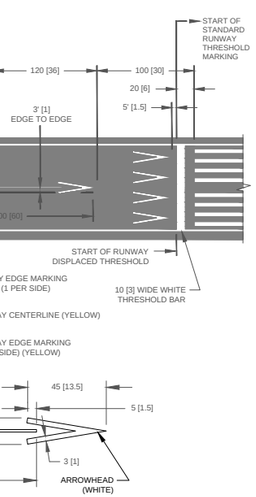


NOTES:
1. ALL MARKINGS TO INCLUDE A BLACK OUTLINE THAT EXTENDS A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF MARKINGS
2. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS
3. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
4. UNLESS NOTED OTHERWISE, ALL MARKINGS ON THIS FIGURE ARE WHITE (WITH BLACK OUTLINE),

1 / C450

MARKING - PRECISION RUNWAY

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-1)



RUNWAY WIDTH	NUMBER OF ARROWHEADS	SPACING BETWEEN ARROWHEADS (W = RUNWAY WIDTH)	SPACING TO RUNWAY EDGE
≥ 100 [30]	4	W/4	W/8

NOTES:
1. SEE FAA AC 150/5340 (CURRENT EDITION) FOR COMPLETE MARKING REQUIREMENTS.
2. ALL DIMENSIONS ARE EXPRESSED IN FEET [METERS].
3. RUNWAY EDGE MARKINGS, WHEN USED ON THE RUNWAY, EXTEND INTO THE DISPLACED AREA.
4. RUNWAY MARKINGS (EXCEPT HOLDING POSITION MARKINGS) INCLUDING THOSE IN THE DISPLACED THRESHOLD ARE WHITE.

4 / C450

MARKING - DISPLACED THRESHOLD

SCALE: NTS — ADAPTED FROM FAA 5340-1 (FIGURE A-7)

RUNWAY 7R-25L PAVEMENT REHABILITATION

GENERAL MITCHELL INTERNATIONAL AIRPORT (MKE)

5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE, SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE, MILWAUKEE, WI 53207

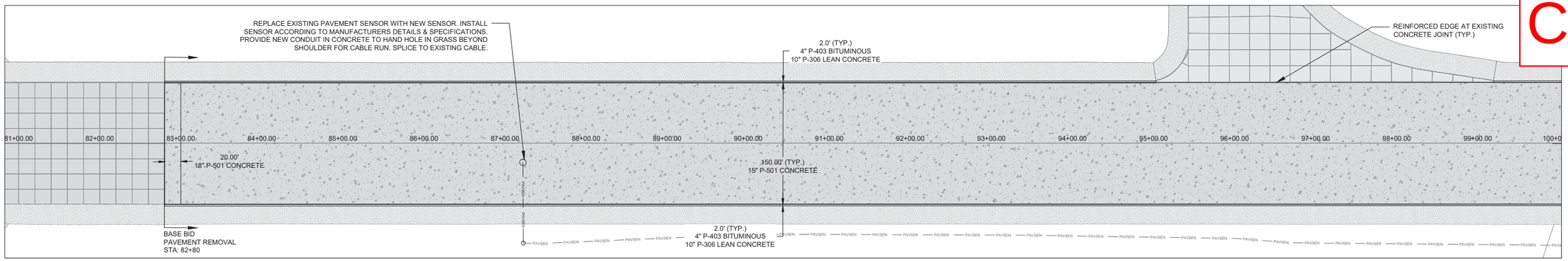
REVISIONS:

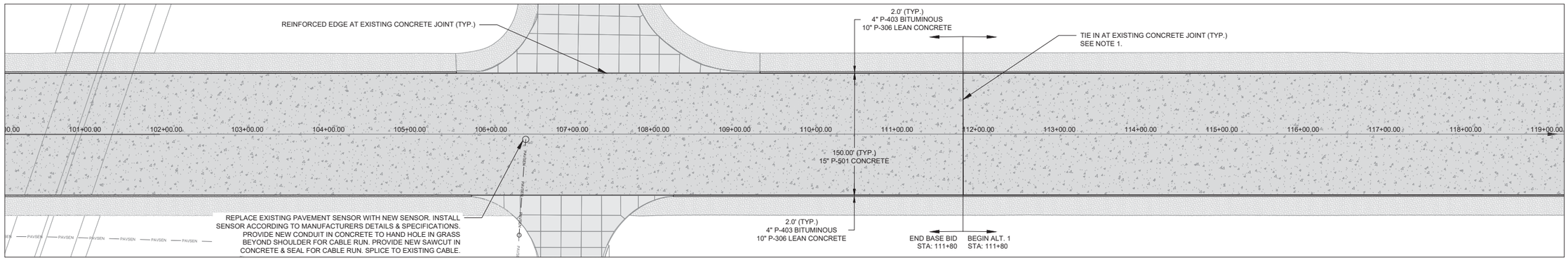
DATE:
05/04/2020
PROJECT:
A392-20184
AIP PROJECT #
TBD
SITE NO:
290
BUILDING NO:
N/A

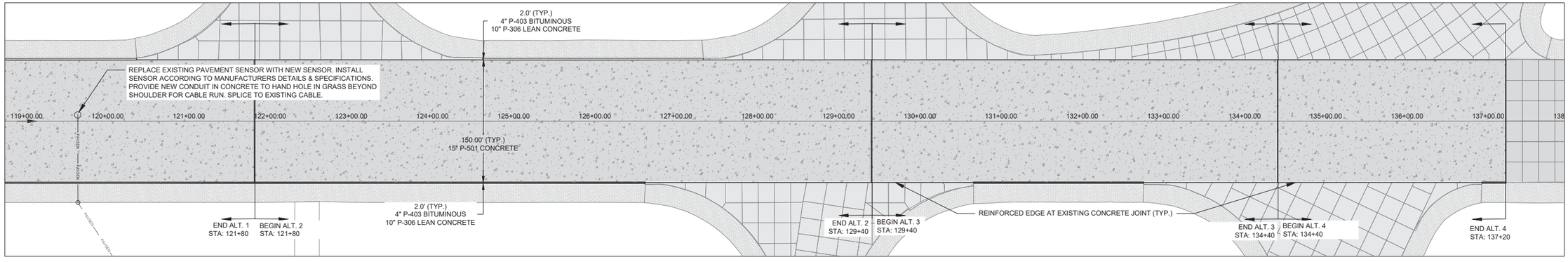
PAVEMENT MARKING DETAILS

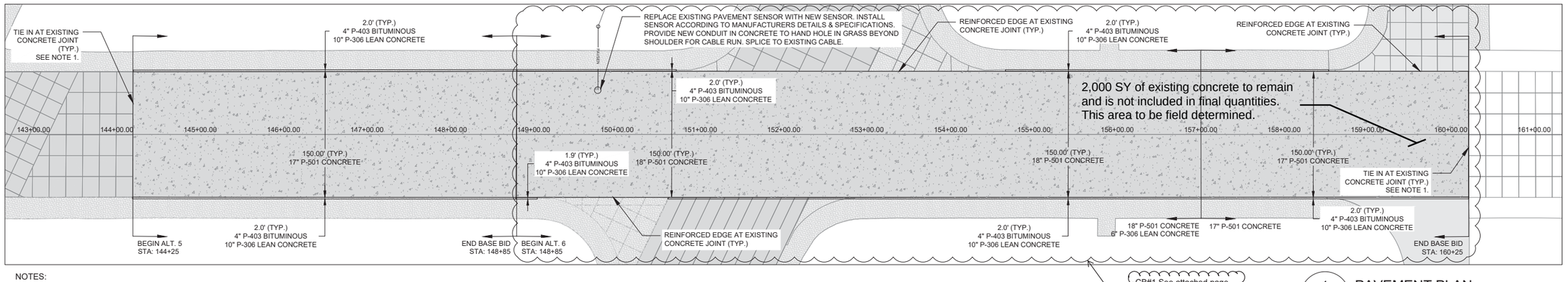
C450

CB #1









CB#1 See attached page for existing and proposed sections by stationing and all quantities.

NOTES:
1. THE LIMITS OF THE PROJECT ON THE RUNWAY SHALL BE ADJUSTED TO MATCH THE CLOSEST EXISTING CONCRETE JOINT ON THE RUNWAY.
2. CONTRACTOR TO SURVEY EXISTING PAVEMENT PRIOR TO PAVEMENT REMOVAL. NEW PAVEMENT TO MATCH EXISTING ELEVATION. SEE PSP-22 FOR SURVEY REQUIREMENTS.

1 / C102 PAVEMENT PLAN
SCALE: 1" = 60'

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

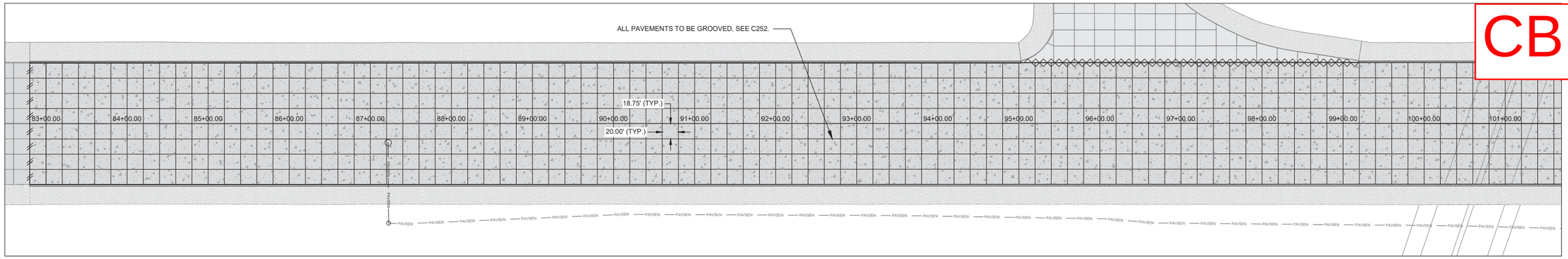
Milwaukee County Dept. of Administrative Services
FACILITIES MANAGEMENT DIVISION
Architectural, Engineering & Environmental Services
DOWNTOWN OFFICE: 633 W. WISCONSIN AVE, SUITE 1000, MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE, MILWAUKEE, WI 53207

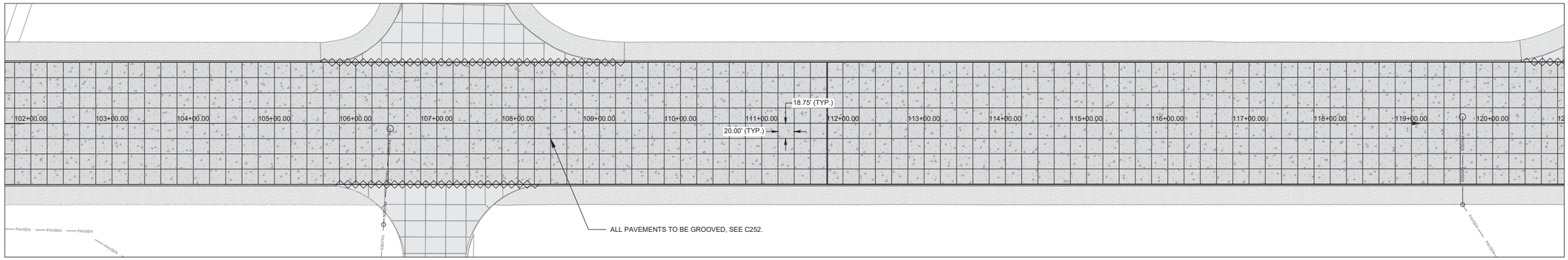
REVISIONS:
CB#1 11/10/2020

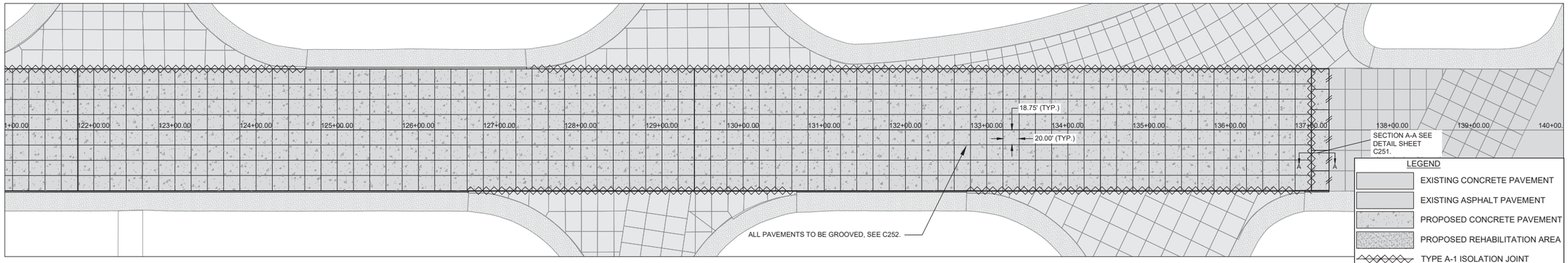
DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT #: TBD
SITE NO: 290
BUILDING NO: N/A

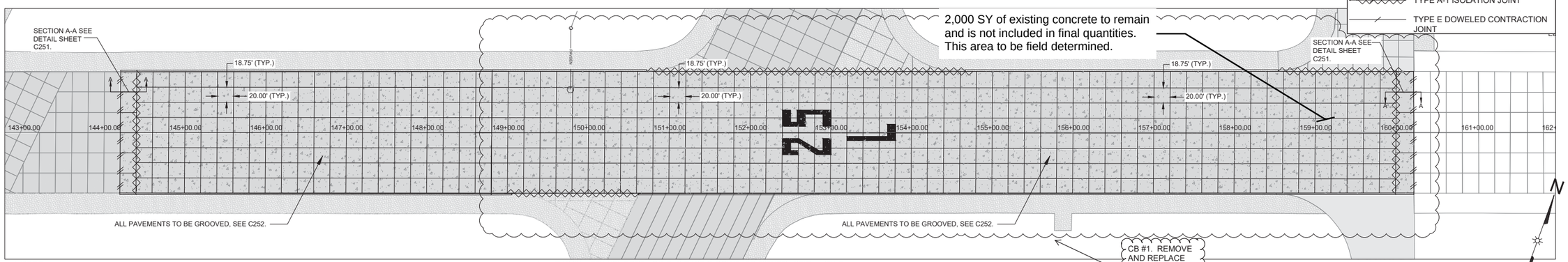
PAVEMENT PLAN
C102

CB #1









NOTES:

1. WHERE PROPOSED CONCRETE IS ADJACENT TO EXISTING CONCRETE, NOT SEPARATED BY AN ISOLATION JOINT, PROPOSED JOINT SPACING SHALL BE ADJUSTED IN THE FIELD TO MATCH THE EXISTING JOINT SPACING.
3. TYPICAL LONGITUDINAL JOINT IS TYPE E DOWELED CONSTRUCTION JOINT.
4. TYPICAL TRANSVERSE JOINT IS TYPE C DOWELED CONTRACTION JOINT.
5. TYPE E PAVEMENT JOINTS SHALL BE PLACED AT THE END OF EACH DAYS PAVING AS NEEDED.
6. SECTION A-A REINFORCED ISOLATION JOINT SHALL BE PLACED AT THE PROJECT LIMITS DEPENDING ON ALTERNATES AWARDED TO THE PROPOSED PCC AND EXISTING RUNWAY SECTION.

1 / C103 PAVEMENT PLAN

SCALE: 1" = 60'

Page 2.2

RUNWAY 7R-25L PAVEMENT REHABILITATION
GENERAL MITCHELL INTERNATIONAL AIRPORT
5300 S. HOWELL AVE., MILWAUKEE, WI 53207

Milwaukee County Dept. of Administrative Services
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DOWNTOWN OFFICE: 633 W. WISCONSIN AVE, SUITE 1000; MILWAUKEE, WI 53203
AIRPORT ENGINEERING OFFICE: 5300 S. HOWELL AVE; MILWAUKEE, WI 53207

CB#1 11/10/2020

REVISIONS:
CB#1 11/10/2020

DATE: 05/04/2020
PROJECT: A392-20184
AIP PROJECT # TBD
SITE NO: 290
BUILDING NO: N/A

PAVEMENT PLAN
C103

CB #1

Construction Bulletin #1
11/10/2020

1. Existing Pavement; Some to be removed
    a. 148+85 – 156+85 = 18” PCC, 6” ECONOCRETE, 8” CRUSHED AGG.
    b. 156+85 – 160+07 = 16” PCC, 8” BIT.PVMT, 12” GRAVEL BASE
    c. 160+07 – 160+27 = 14” PCC, 2” – 4” BIT. PVMT, 12” PCC
2. Proposed Pavement; Some existing to stay
    a. 148+85 – 156+85 = 18” PCC, 6” ECONOCRETE, 8” EX. CRUSHED AGG
    b. 156+85 – 160+07 = 17” PCC, 0.75” BIT.PVMT, 6.25” EX. BIT PVMT, 12” EX. GRAVEL BASE
    c. 160+07 – 160+27 = 17” PCC, 1” BIT.PVMT, 12” EX. PCC
3. Remove all quantities from existing ALTERNATE 6 from contract.
4. New quantities for Alternate 6 based on existing / proposed areas above:

Line Item No.	Short Description	Unit of Measure	Item Quantity
6.1.1	PAVEMENT REMOVAL	SY	17374
6.2.1	COLD MILLING, BITUMINOUS, 1.75-INCH	SY	3372
6.3.1	COLD MILLING, BITUMINOUS, 3-INCH	SY	334
6.4.1	LEAN CONCRETE BASE COURSE, 10-INCH	SY	340
6.5.1	LEAN CONCRETE BASE COURSE, 6-INCH & PREPARATION OF EXISTING AGGREGATE BASE	SY	13334
6.6.1	HMA PAVEMENT 6MT 58-28S	TON	245
6.7.1	ASPHALT PAVEMENT SURFACE COURSE	TON	76
6.8.1	CEMENT CONCRETE PAVEMENT, 17-INCH	SY	3700
6.9.1	CEMENT CONCRETE PAVEMENT, 18-INCH	SY	13334
6.10.1	EMULSIFIED TACK COAT	GAL	604
6.11.1	GROOVING	SY	16526
6.12.1	SUPPLY & INSTALL PAVEMENT SENSOR & CABLE	EACH	1
6.13.1	COMMISSION & TEST NEW PAVEMENT SENSOR	EACH	1

ATTACHMENT 2

SPECFICATIONS

I. AIRPORT SAFETY

A. Regulations

1. The operation of the airport is regulated by the Federal Aviation Administration and its rules and regulations governing safety shall be enforced. Contractors shall acquaint themselves with FAA Advisory Circular 150/5370-2 current edition Operational Safety On Airports During Construction and abide by operating rules and regulations and shall be responsible for enforcement of those rules and regulations concerning employees, subcontractors and material suppliers.

2. Failure to observe Safety requirements will be reason to remove Contractors or Subcontractors or their personnel or material from the site.

B. General Safety

1. The geographical form of open trenches, excavations and stockpiled material shall be outlined with low profile barricades with reflective alternating orange and white markings; flashing or steady red lights; 12'x12' bright orange nylon flags.

2. Hazardous areas, in which aircraft are not to enter, shall be indicated by use of low profile reflective barricades with alternating orange and white markings placed end to end with a designated gap for vehicle traffic. Barricades may need to be supplemented with orange flags at least 12 by 12 inches square and installed so that they are always in the extended position and properly oriented. The barricades must be supplemented with flashing or steady red lights. Do not use solar lighting on barricades without prior written permission of airport. All batteries must be new at start of project and replaced periodically during project. Low profile barricades shall be weighted down with either water and/or sandbags.

   It shall be the contractor's responsibility to maintain the flashing lights at all times. If any light is found to be inoperative, it shall be repaired or replaced within 24 hours of notification.

3. Smoking on aircraft parking ramps or within the confines of a fuel storage area is prohibited.

4. Welding or torch cutting operations require specific permission of the Airport Fire Department. When permitted, adequate fire suppression equipment must be available in close proximity to the job.

5. Waste material shall not be permitted to accumulate and create a hazard for aircraft and associated ground support operations and shall be removed from the airport premises on a regular basis.

6. Debris such as mud, stones, etc. which is inadvertently dropped within aircraft operating areas must be cleaned up immediately. Therefore, construction/repair projects that require motorized equipment to traverse the air operations area will require the contractor to have on site a pick-up broom type mechanical sweeper.

7. Any utility serving the airport shall not be disconnected without prior approval from airport management.

8. Runways or taxiways closed for extended periods of time must be marked in accordance with FAA Advisory Circular 150/5340-1 current edition, Standards for Airport Markings.

9. Prior to the first day of work, each contractor, including subcontractors, shall provide a list to the Airport Operations Office of supervisory personnel who will be involved in the project. This list shall contain a 24 hour telephone number of those persons who should be called in the event of an emergency during evenings and weekends.

C. Personnel Safety

1. Contractor will advise their employees to remain within the limits of the designated work area and the routes to be used for access to and from the job site. Access routes to and from the job site will be determined by airport management.

2. Contractor will be required to provide his/her employees with proper hearing and other safety protection devices as appropriate.

D. Vehicle Safety

1. No person shall operate a motorized vehicle on airport property without a valid state-issued Vehicle Operator's License.

2. No vehicle shall be operated in a reckless or negligent manner.

3. No person shall operate a motor vehicle under the influence of alcohol or narcotic drugs.

4. No vehicle shall be operated which may be considered to be overloaded or carrying more passengers than the vehicle was designed to carry.

5. No vehicle shall be operated on the airport that is constructed, equipped, or loaded in a manner considered dangerous to persons or property.

6. No vehicle shall be operated on the airport with someone riding on the running board, or standing up in the open body of the vehicle.

7. No vehicle shall be operated in excess of posted speed limits.

8. All vehicles, when not in use, shall be parked in designated parking locations.

9. No person shall operate motorized ground equipment on the Air Operations Area (AOA) of the airport without an airport-issued driver's endorsement unless they are escorted (physically or visually) by an authorized person.

10. The operation of motorized vehicles on the Air Operations Area shall be in accordance with the Airport Operations IET system for driving in the non-movement areas of the Airport.

11. All vehicles operating on the Air Operations Area shall display a three (3) foot by three (3) foot flag consisting of alternating international orange and white squares of not less than one (1) foot on each side. The flag shall be displayed in full view at the highest point on the vehicle. An amber flashing light affixed to the top of the vehicle may be used in lieu of a flag.

12. Vehicles and equipment parked on or near an air operations area during hours of darkness or restricted visibility shall be outlined through the use of low profile reflective barricades with flashing red lights. No solar lights on barricades without prior written permission of airport. All batteries must be new at start of project and replaced periodically during project.

13. When parking adjacent to an active runway, all vehicles and equipment must be parked parallel to the runway and at least 125 feet outside of the runway lights.

14. Whenever vehicles are required to cross or operate on the movement area (runways and taxiways) effective control procedures shall be established prior to the first day of work. No vehicle will be permitted to cross or operate on an open runway without specific permission obtained through two-way radio communications with the Control Tower. Vehicle control requirements and procedures will be discussed at the preconstruction meeting.

15. All non-radio vehicles that require access to the movement area of the airport must be escorted by a person specifically designated by airport management.

16. Cranes and other high profile construction equipment shall be reduced to their lowest profile when not in use.

II. AIRPORT SECURITY

New applications - $75.00 (Includes badge, issues or not)
New fingerprints - $25.00
Total = $100.00

Renewal applications – $25.00
Renewal fingerprints - $25.00
Total = $50.00

Fees to replace Lost, Stolen*, or Destroyed ID's:
1st – $75.00
2nd - $125.00
3rd - $200.00
*Stolen ID's accompanied by a valid police report will incur a $25.00 charge for the 1st ID, $50.00 charge for the 2nd ID, $100.00 charge for the 3rd ID.

Not Returned ID Fee (may be assessed against the company or the individual, and is refundable if turned in):
1st - $100.00
2nd - $150.00
3rd and subsequent - $200.00

These fees are cumulative for a company. For example, company X has three employees that do not return ID's, the fees would total $450.00 for each additional ID not returned. After that it would be $200.00 each. If company X has a total of nine not retuned ID's, the total would be $1650.00. However, if 4 of those ID's were returned, a credit of $800.00 would be processed. If all of the ID's are returned, then a complete refund would be due, and the next Not returned ID would incur a $100.00 fee, etc.

If an individual returns the ID, a credit would be processed against their credit card, if that is how it was paid for initially, or by a check payable to them in about 4 weeks from the date of return.

A. General Security

1. The operation of the airport is regulated by the Federal Aviation Administration (FAA) and the Transportation Security Administration (TSA). The security rules and regulations established by these agencies shall be enforced. Contractors shall acquaint themselves with these rules and regulations and will be held accountable to ensure that all employees, subcontractors, and material suppliers abide by them.

2. The FAA and TSA have established civil penalty policies whereby monetary penalties may be assessed against individuals, companies, airlines, airports, or any combination thereof. These penalties range from $1,000.00 to $25,000.00 per violation. Any penalties assessed against General Mitchell International Airport by the FAA or the TSA as a result of negligence, or failure to adhere to established policies or procedures on the part of a contractor, subcontractor, material supplier or their employees, will be assessed to the prime contractor.

3. Failure to adhere to security rules and regulations will be reason to remove contractors or subcontractors or their personnel or material from the site.

4. **All vehicles and personnel are subject to search at any time.**

B. Regulations

1. 49 Code of Federal Regulations (CFR) 1542 is the governing regulation that requires each airport

operator to establish and maintain, in writing, a security program that addresses, among other things, the conduct of required background checks and the establishment of an identification and access control system. This regulation further requires that a training program be established, and that everyone that applies for an airport issued identification/access media badge be trained in certain airport security procedures. General Mitchell International Airport accomplishes this by requiring everyone to view a security training video and pass a written test. This information is provided in English only and, if needed, special arrangements must be made with the Airport Badging Office (747-4537) to have an interpreter present to assist in the administration of this requirement.

2. 49 CFR 1520 establishes the requirement to safeguard information obtained as a result of this training. The information that is provided is considered Sensitive Security Information (SSI) and is therefore only to be discussed with persons that have a "need to know." Additional federal penalties can be assessed against personnel for the unauthorized disclosure of this information.

3. Milwaukee County Ordinance 4.02(8)(c)(8) states: "Airport-issued Personnel Identification Badges are the property of the County. They must be returned to the Airport upon Revocation, Suspension, ending employment at the Airport or upon demand of the County." **Failure to return Identification badges may delay or impact the final payment of the contract.**

C. Badging Procedures

1. All companies (prime and subcontractors) that conduct business at General Mitchell International Airport must have an MKE Company Registration Information & Authorization form on file with the airport. This form can be obtained from the Airport Badging Office (Monday – Friday, 8:00 a.m. to 4:30 p.m., excluding holidays). This form must be completed by the company and returned to the Airport Badging Office for further processing. This process can take 7 business days or more to complete. This form must be completed for each individual airport project, unless there is a break of 90 days or less between projects where the company is doing business.

2. All companies (prime and subcontractors) conducting business in any security area of the airport, as defined in the Airport Security Program (ASP) - except as noted in paragraphs D. and E. below are required to obtain an airport issued identification/access media badge, hereinafter referred to as badge, for **each** of their employees. To obtain a badge for each employee, the employer must complete a MKE Authorized Signatory Designation form. This form can be obtained from the Airport Badging Office, during the same days and hours as previously noted. This form must be completed by an officer of the company that has responsibility for ensuring that the procedures on the form can and will be adhered to. This person can then appoint other personnel in the organization to be Authorized Signers for airport badge application forms.

3. An Authorized Signer must complete an airport Badge application form and then successfully pass a fingerprint based Criminal History Records Check (CHRC) and a Security Threat Assessment (STA), and must sign and date an Authorized Signer training form before they can sign the application form for other employees to start the badging process.

4. Criminal History Records Check (CHRC) procedure for each individual consists of the following:

a. Complete a Criminal History Records Check Application form.
b. Provide two forms of identification (these can be the same as the STA **OR** one must contain a photograph and one must be issued by a government agency. ***Each applicant must do this in person.***
c. Be fingerprinted.

NOTE: The actual time to complete this process should be less than 30 minutes, however, due to unanticipated volume this may take more time. This information is submitted to the TSA immediately. The fingerprint results should be received within 24 hours. When the results are received, if the results are not

favorable, the employee will be notified to come and see the Airport Security Coordinator (ASC) or an Assistant ASC, so that the individual receives information on their rights. The employee cannot schedule any additional training until after notification in regards to the STA.

5. Security Threat Assessment (STA) procedure for each individual consists of the following:

    a. Complete a General Mitchell International Airport I.D. Badge Application form.
    b. Provide two forms of identification as indicated in the [*]List of Acceptable Documents. (See Page 9) Only one item from List A OR one item from List B **AND** one item from List C at the time that the application is turned in to the Airport Badging Office. ***Each applicant must do this in person.***
    c. Sign and date a Privacy Act Notice form.

[*] - This list is subject to change without notice. The most recent Form I-9 List will be used.

NOTE: The actual time for the employee to complete these items should be less than 30 minutes, however, due to unanticipated volume this may take more time. The STA information is entered in the airport computer database and is sent to the Transportation Security Clearinghouse (TSC) for processing. The results should be received within 72 hours. When the results are received, if they are favorable, the employer will be notified to have the employee call or go online to schedule testing for the Security Video **and/or** Non-Movement Area Driver's Training or the Movement Area Driver's Training as appropriate. If the results are not favorable, the TSA will contact the individual and instruct them on how to proceed. The Airport Badging Office may not be permitted to discuss the results with the employer. There is ***no fee*** for this process.

6. Security Video **and/or** Driver's Training Video (if applicable)

    a. The Security Video is **mandatory** for **all** badged personnel.
    b. The Non-Movement Area Driver's Training Video is required only if duties require driving on the areas of the airport that do not cross taxiways and/or runways.

NOTE: Scheduling for these training sessions **must** be done by calling the Airport Badging office at 414-747-4537 or online (internet address will be provided as it becomes available). The actual time to complete the Security Video should be 60 minutes. The actual time to complete the Non-Movement Area Driver's Training video should be 45 minutes. There is ***no fee*** for this process.

D. Perimeter Security – Zone 1 (Terminal area)

1. For personnel that do not have unescorted access authority (badged) to enter into the airport perimeter through a security checkpoint, i.e. one-time material delivery drivers, concrete delivery drivers, dump truck driver's, and vehicle drivers that work on daily terms, even when they are under the escort of someone that does have unescorted access, must provide a valid (unexpired) photographic identification, issued by a government authority, (driver's license, passport, military ID, etc.) and obtain a Visitor' s badge. This badge must be returned to the point of entry or accounted for by another checkpoint.

2. All vehicles must be prominently marked with the name of the company, either stenciled/painted on or by a magnetic sign. This marking must be on both sides of the vehicle, preferably on the front cab doors, in letters large enough to read from twenty (20) feet away, approximately three (3) inches high. For company vehicles that are not on the authorized access list a vehicle placard will be issued. This placard must be returned to the point of entry or accounted for by another checkpoint.

NOTE: The time needed for the necessary checks of personnel/vehicles to enter this area can be as much as fifteen (15) minutes. There is ***no fee*** for this process.

E. Perimeter Security – Zones 2-9 (All areas Except Zone 1 inside the perimeter fence)

1. For personnel that do not have unescorted access authority (badged) to enter into the airport perimeter through a vehicle access point, i.e. one-time material delivery drivers, concrete delivery drivers, dump truck drivers, and vehicle drivers that work on daily terms, must be escorted by someone that does have unescorted access authority.

2. All vehicles must be prominently marked with the name of the company, either stenciled/painted on or by a magnetic sign. This marking must be on both sides of the vehicle, preferably on the front cab doors, in letters large enough to read from twenty (20) feet away, approximately three (3) inches high.

NOTE (D & E): At the Airport's discretion, visual escort by qualified personnel may substitute for physical escort. Qualified personnel shall be Airport Contract Security provider; Airside or Landside Operations; Airport Maintenance; Airport Sheriff's Department; or Airport Public Safety & Security. This provision will be determined at or before the Pre-con meeting.

Table of Estimated Times for Security Items

Activity	Estimated time in person	Estimated time to completion
MKE Company Registration Information & Authorization	30 minutes	7 days
MKE Authorized Signatory Designation form	30 minutes	3 to 5 days (dependent upon authorized signers STA and CHRC results
Authorized Signer Training	15 minutes	15 minutes
Criminal History Records Check (CHBC)	30 minutes	1 day
Security Threat Assessment (STA)	30 minutes	3 days
Security Video	60 minutes	
Driver's Training Video (if applicable)	45 minutes	
Total time to receive a Badge = 3 to 7 business days (estimated)		

List of Acceptable Documents

List A **OR** **List B** **AND** **List C**

Documents that Establish Both Identity and Employment Eligibility

1. U.S. Passport (unexpired or expired)
2. Certificate of U.S. Citizenship (USCIS Form N-560 or N-561)
3. Certificate of Naturalization (USCIS Form N-550 or N-570)
4. Unexpired foreign passport, with I-551 stamp or attached Form I-94 indicating unexpired employment authorization
5. Permanent Resident Card or Alien Registration Receipt Card with photograph (USCIS Form I-151 or I-551)
6. Unexpired Temporary Resident Card (USCIS Form I-688)
7. Unexpired Employment Authorization Card (USCIS Form I-688A)
8. Unexpired Reentry Permit (USCIS Form I-327)
9. Unexpired Refugee Travel Document (USCIS Form I-571)
10. Unexpired Employment Authorization Document issued by USCIS that contains a photograph

Documents that Establish Identity

1. Driver's license or ID card issued by a State or outlying possession of the United States provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address
2. ID card issued by Federal, State, or local government agency or entity provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address
3. School ID card with a photograph
4. Voter's registration card
5. U.S. Military card or draft record
6. Military dependent's ID card
7. U.S. Coast Guard Merchant Mariner Card
8. Native American tribal document
9. Driver's license issued by a Canadian government authority

For persons under the age of 18 who are unable to present a document listed above

1. School record or report card
2. Clinic, doctor, or hospital record
3. Day-care or nursery school record

Documents that Establish Employment Eligibility

1. Social Security card issued by the Social Security Administration (other than a card stating it is not valid for employment)
2. Certification of Birth Abroad Issued by the Department of State (Form FS-545 or Form DS-1350)
3. Original or certified copy of a birth certificate issued by a State, county, municipal authority, or outlying possession of the United States bearing an official seal
4. Native American tribal document
5. U.S. Citizen ID Card (USCIS Form I-197)
6. ID Card for use of Resident Citizen in the United States (USCIS Form I-179)
7. Unexpired employment authorization document issued by USCIS (other than those listed under List A)

NOTE: The applicant can present one item from Column A, *OR*, if they do not have an item from Column A, they must present one item from Column B *AND* one item from Column

Part 2 – General Construction Items

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

- 7 Test Methods and Procedures
- 8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

a. Specification item number (e.g., P-401)

b. Item description (e.g., Hot Mix Asphalt Pavements)

c. Test type (e.g., gradation, grade, asphalt content)

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)

f. Responsibility (e.g., plant technician)

g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

(8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description
(2) Test designation
(3) Location
(4) Date of test
(5) Control requirements
(6) Test results
(7) Causes for rejection
(8) Recommended remedial actions
(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Not Used

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

Item P-306 Lean Concrete Base Course

DESCRIPTION

306-1.1 This item shall consist of a lean concrete subbase material that is composed of aggregate and cement uniformly blended together and mixed with water. The mixture may also include approved cementitious additives, in the form of fly ash or slag, and chemical admixtures. The mixed material shall be spread, shaped, and consolidated using concrete paving equipment in accordance with these specifications and in conformity to the lines, grades, dimensions, and typical cross-sections shown on the plans.

MATERIALS

306-2.1 Aggregate. The coarse aggregate fraction shall be crushed stone, crushed or uncrushed gravel, crushed and adequately seasoned, air-cooled, iron blast furnace slag, crushed recycled concrete, or a combination thereof. The fine aggregate fraction may be part of the natural aggregate blend as obtained from the borrow source or it may be natural sand that is added at the time of mixing. The aggregate shall meet the gradation and material requirements in the tables below.

Aggregate Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate Portion (retained on the No. 4 (4.75 mm) sieve)		
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Flat Particles, Elongated Particles, or Flat and Elongated Particles[1]	10% maximum, by weight, for fraction retained on the ½ inch (12.5mm) sieve and 10% maximum, by weight, for the fraction passing the 1/2-inch (12.5 mm) sieve	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate Portion (passing the No. 40 (425µm) sieve)		
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88

[1] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

Aggregate Gradation for Lean Concrete

Sieve Size (square openings)	Percentage by Weight Passing Sieves
	Gradation B
1-1/2 inch (37.5 mm)	**--**
1 inch (25.0 mm)	**100**
3/4 inch (19.0 mm)	**70 - 100**
No. 4 (4.75 mm)	**35 - 65**
No. 40 (425 µm)	**15 - 30**
No. 200 (75 µm)	**0 - 15**

306-2.2 Sampling and testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base stockpile in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraphs 306-2.1 and 306-2.2. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

306-2.3 Cement. Cement shall conform to the requirements of ASTM C150, Type I.

306-2.4 Cementitious additives. Pozzolanic and slag cement may be added to the lean concrete mix. If used, each material must meet the following requirements:

a. Pozzolan. Pozzolanic materials must meet the requirements of ASTM C618, Class F, or N with the exception of loss of ignition, where the maximum shall be less than 6%.

b. Slag cement (ground granulated blast furnace (GGBF) slag). Slag shall conform to ASTM C989, Grade 100 or 120.

306-2.5 Chemical admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all the requirements listed below. In addition, the RPR may require the Contractor to submit complete test data showing that the material to be furnished meets all the requirements of the cited specification.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260.

b. Water-reducing admixtures. Water-reducing, set-controlling admixtures shall meet the requirements of ASTM C494, Type A, D, E, F, or G. Water-reducing admixtures shall be added at the mixer separately from air-entraining admixtures in accordance with the manufacturer's printed instructions. The air entrainment agent and the water-reducing admixture shall be compatible.

c. Retarding admixtures. Retarding admixtures shall meet the requirements of ASTM C494, Type B or D.

d. Accelerating admixtures. Accelerating admixtures shall meet the requirements of ASTM C494, Type C.

306-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

306-2.7 Curing materials. For curing lean concrete, use white-pigmented, liquid membrane-forming compound conforming to ASTM C309, Type 2, Class B, or clear or translucent Type 1-D, Class B with white fugitive dye.

306-2.8 Bond Breaker. Not used.

COMPOSITION OF MIXTURE

306-3.1 Mix design. The lean concrete mix design shall be based on trial batch results conducted in the laboratory. The lean concrete shall be designed to meet the criteria in this section.

Compressive strength shall not be less than 500 pounds per square inch (3,445 kPa) nor greater than 800 pounds per square inch (5,516 kPa) at seven (7) days. Compressive strengths shall be taken as the average of two compressive strength test results. All compressive strength specimens shall be prepared and tested in accordance with ASTM C192 and ASTM C39, respectively.

The percentage of air entrainment shall be 6%, ±1/2%. Air content shall be determined by testing in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag and other highly porous coarse aggregate.

If there is a change in aggregate sources, type of cement used, or pozzolanic materials, a new mix design must be submitted

306-3.2 Submittals. At least 30 days prior to the placement of the lean concrete, the Contractor shall submit certified test reports to the RPR for those materials proposed for use during construction, as well as the mix design information for the lean concrete material. The certification shall identify the

specifications and test standard, the name of the testing laboratory, the date of the tests, and a statement that the materials comply with the applicable specifications. Tests older than six (6) months shall not be used. The submittal package shall include the following:

a. Sources of materials, including aggregate, cement, admixtures, and curing and bond breaking materials.

b. Physical properties of the aggregates, cement, admixtures, curing and bond breaking materials.

c. Mix design:

- Mix identification number
- Weight of saturated surface-dry aggregates (fine and coarse)
- Combined aggregate gradation
- Cement factor
- Water content
- Water-cementitious material ratio (by weight)
- Volume of admixtures and yield for one cubic yard (cubic meter) of lean concrete
- Laboratory test results:
- Slump
- Unit weight
- Air content
- Compressive strength at 3, 7, and 28 days (average values)
- Wet-dry and/or Freeze-thaw weight loss

Where applicable, the Contractor shall submit a jointing plan for transverse joints in the lean concrete layer for approval by the RPR.

During production, the Contractor shall submit batch tickets for each delivered load.

EQUIPMENT

306-4.1 All equipment necessary to mix, transport, place, compact, and finish the lean concrete material shall be furnished by the Contractor and is subject to inspection and approval by the RPR. The Contractor shall provide certification that all equipment conforms to the requirements of ASTM C94.

306-4.2 Forms. Straight side forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall have a depth equal to the pavement thickness at the edge. Flexible or curved forms of proper radius shall be used for curves of 100 feet (30 m) radius or less. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built-up forms shall not be used, except as approved by the RPR. The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when accepted by the RPR.

306-4.3 Concrete pavers. A fixed form or slip-form concrete paver may be used to place lean concrete. The paver shall be fully energized, self-propelled and capable of spreading, consolidating, and finishing the lean concrete material, true to grade, tolerances, and cross-sections. The paver shall be of sufficient weight and power to construct the maximum specified concrete paving lane width, at adequate forward

speed, without transverse, longitudinal or vertical instability or without displacement. Slip-form pavers shall be equipped with electronic or hydraulic horizontal and vertical control devises. Bridge deck pavers are approved as paver-finishing machines for lean concrete, provided they are capable of handling the amount of lean concrete required for the full-lane width specified, and capable of spreading, consolidating, and finishing the lean concrete material, true to grade, tolerances, and cross-sections.

306-4.4 Vibrators. For fixed-form construction, vibrators may be either the surface pan type or internal type with either immersed tube or multiple spuds for the full width of the slab. They may be attached to the spreader, the finishing machine, or mounted on a separate carriage. They shall not come in contact with the subgrade or forms.

For slip-form construction, the paver shall be accomplished by internal vibrators for the full width and depth of the pavement being placed. The number, spacing, frequency, and eccentric weights of vibrators shall be provided to achieve acceptable consolidation without segregation and finishing quality. Internal vibrators may be supplemented by vibrating screeds operating on the surface of the lean concrete. Vibrators and screeds shall automatically stop operation when forward motion ceases. An override switch shall be provided.

Hand held vibrators may be used in irregular areas.

306-4.5 Joint saws. The Contractor shall provide a sufficient number of saws with adequate power to cut contraction or construction joints to the required dimensions as shown on the plans. The Contractor shall provide at least one standby saw in good working order.

CONSTRUCTION METHODS

306-5.1 Control Strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. Control strips that do not meet specification requirements shall be removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. Upon acceptance of the control strip by the RPR, the Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

306-5.2 Weather limitations. The Contractor shall follow the recommended practices in American Concrete Institute (ACI) 306R, Guide to Cold Weather Concreting**.** The temperature of the mixed lean concrete shall not be less than 50°F (10°C) at the time of placement. The lean concrete shall not be placed when the ambient temperature is below 40°F (4°C) or when conditions indicate that the temperature may fall below 35°F (2°C) within 24 hours. The lean concrete shall not be placed on frozen underlying courses.

The Contractor shall follow the recommended practices in ACI 305R, Guide to Hot Weather Concreting. The lean concrete temperature from initial mixing through final cure shall not exceed 90°F (32°C). When the maximum daily air temperature exceeds 85°F (30°C), the forms and/or the underlying material shall be sprinkled with water before placing the lean concrete.

The Contractor should stop operations prior to and during rain allowing time to cover and protect any plastic lean concrete. Areas damaged by rain shall be refinished or replaced at the Contractor's expense.

306-5.3 Maintenance. The Contractor shall protect the lean concrete from environmental or mechanical damage. Traffic shall not be allowed on the pavement until test specimens made per ASTM C31 have attained a compressive strength of 500 psi (3445 kPa) when tested per ASTM C39. The Contractor shall maintain continuity of the applied curing method for the entire curing period.

306-5.4 Form setting. Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/4 inch (6 mm) at any joint. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). Forms shall be cleaned and oiled prior to the placing of lean concrete.

306-5.5 Preparation of underlying course. The underlying course shall be checked and accepted by the RPR before placing operations begin. Prior to placing the material, the final grade should be firm, moist and free of frost. Use of chemicals to eliminate frost will not be permitted. The underlying course shall be wetted in advance of placing the lean concrete base course.

306-5.6 Grade control. Grade control shall be as necessary to construct the layer to the profile and cross-sections as shown on the plans.

306-5.7 Mixing. The batch plant site, layout, equipment, and provisions for transporting material shall assure a continuous supply of material to the work. Stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials.

All lean concrete shall be mixed and delivered to the site per the requirements of ASTM C94. The mixing time should be adequate to produce lean concrete that is uniform in appearance, with all ingredients evenly distributed. Mixing time shall be measured from the time all materials are emptied into the drum (provided all the water is added before one-fourth the preset mixing time has elapsed) and continues until the time the discharge chute is opened to deliver the lean concrete.

If mixing in a batch plant, the mixing time shall not be less than 50 or greater than 90 seconds. If mixing in a truck mixer, the mixing time shall not be less than 70 or more than 125 truck-drum revolutions at a mixing speed of not less than six (6) or more than 18 truck-drum revolutions per minute.

The elapsed time from the addition of cementitious material to the mix until the lean concrete is deposited in place at the work site shall not exceed 45 minutes when the concrete is hauled in non-agitating trucks, or 90 minutes when it is hauled in truck mixers or truck agitators.

Re-tempering lean concrete will not be permitted, except when delivered in truck mixers. With truck mixers, additional water may be added to the batch materials if the addition of water is added within 45 minutes after the initial mixing operations and the water/cement ratio specified in the mix design is not exceeded.

306-5.8 Placing. The lean concrete material shall be placed continuously at a uniform rate on the underlying course minimizing segregation and handling of the mix. Rakes shall not be allowed for spreading the lean concrete.

306-5.9 Finishing. Shape the finished surface of the lean concrete base layer to the specified lines, grades, and cross-section. Hand finishing will not be permitted except in areas where the mechanical finisher cannot operate.

The surface of the lean concrete shall have a coarse texture.

306-5.10 Construction limitations. All placement and finishing operations shall be completed within two (2) hours from the start of mixing. Material not completed within the 2-hour time limit shall be removed and replaced at the Contractor's expense.

At the end of each day's construction and/or when operations are interrupted for more than 30 minutes, a straight transverse construction joint shall be formed by a header or by cutting back into the compacted material to form a true vertical face.

Completed portions may be opened to light traffic when it has achieved its 7-day strength and the curing is not damaged.

306-5.11 Joints. Locate all longitudinal and transverse construction joints as shown on the plans. Longitudinal joints shall be within 6 inches (150 mm) of planned joints in the overlaying concrete pavement and transverse joints shall be within 3 inches (75 mm) the planned joints of the overlying concrete surface. Joints shall be sawn as soon as the base can support the saws without damage to the lean concrete base. Joints shall be constructed by sawing the hardened lean concrete to a depth of at least one-third the thickness of the lean concrete base, or 1/5th the depth of the lean concrete base when constructed using early entry saws.

306-5.12 Curing. Immediately after the finishing operations are complete and within two (2) hours of placement of the lean concrete, the entire surface and edges of the newly placed lean concrete shall be sprayed uniformly with white pigmented, liquid membrane forming curing compound conforming to ASTM C309, Type 2, Class B or clear or translucent Type 1-D, Class B with white fugitive dye in accordance with paragraph 306-2.7. The layer should be kept moist using a moisture-retaining cover or a light application of water until the curing material is applied. The curing compound shall not be applied during rainfall.

The curing material shall be applied at a maximum coverage of 200 square feet per gallon (5.0 m^2/l) using pressurized mechanical sprayers. The spraying equipment shall be a fully atomizing type equipped with a tank agitator. At the time of use, the curing compound in the tank shall be thoroughly and uniformly mixed with the pigment. During application, the curing compound shall be continuously stirred by mechanical means. Edges of the lean concrete layer shall be sprayed with curing compound immediately following placement with slip-form pavers or when side-forms are removed. Hand spraying of odd widths or shapes and lean concrete surfaces exposed by the removal of forms is permitted.

The lean concrete temperature during curing shall be in accordance with paragraph 306-5.2.

If the curing material becomes damaged from any cause, including sawing operations, within the required 7-day curing period or until the overlying course is constructed, the Contractor shall immediately repair the damaged areas by application of additional curing compound or other means approved by the RPR.

306-5.13 Surface tolerance. The Contractor shall perform smoothness and grade checks daily. Any area not meeting smoothness and grade shall be corrected by the Contractor at the Contractor's expense. The Contractor shall provide smoothness and grade data to the RPR on a daily basis.

a. Smoothness. The finished surface shall not vary more than ±3/8-inch (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline, and. moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot grid. The Contractor shall correct any high spots more than 3/8 inch (9 mm) in 12-foot (3.7-m) with a grinding machine or remove and replace the material at the Contractor's expense. Any areas that have been ground shall have curing compound reapplied.

b. Grade. The grade shall be measured on a 50-foot grid and shall be within +/-0.05 feet (15 mm) of the specified grade. When the surface is more than 1/2 inch (12 mm) above the grade shown in the plans, the surface shall be corrected at the Contractor's expense to an elevation that falls within a tolerance of 1/4 inch (6 mm).

306-5.14 Bond-breaker. No bond breaker is required.

MATERIAL ACCEPTANCE

306-6.1 Sampling and testing. Acceptance sampling and testing to determine conformance with the requirements specified in this section will be performed by the RPR for each 1200 square yards. Sampling locations will be determined by the RPR on a random basis per ASTM D3665.

a. Compressive Strength. One sample of freshly delivered lean concrete will be taken for compressive strength for each 1200 square yards in accordance with ASTM C172 and air content tests in accordance with ASTM C231. Two test cylinders will be made and cured from the sample per ASTM C31 and the 7-day compressive strength of each cylinder determined per ASTM C39. The compressive strength will be computed by averaging the two 7-day compressive strengths.

The Contractor shall provide for the initial curing of cylinders in accordance with ASTM C31 during the 24 hours after molding.

b. Thickness. Cores shall be drilled by the Contractor at two different sampling locations for thickness determination for each 1200 square yards. Thickness will be determined by measuring the depth of core holes and computed by averaging the thickness determination of the two locations.

Core holes shall be filled by the Contractor with lean concrete base or non-shrink grout.

306-6.2 Acceptance.

a. Strength. If the lean concrete fails to meet the minimum compressive strength requirements, the Contractor shall remove and replaced the material at the Contractor's expense.

b. Thickness. If the average thickness is not deficient by more than 1/2 inch (12 mm) from the plan thickness, full payment shall be made. When such measurement is deficient by more than 1/2 inch (12 mm) but less than one inch (25 mm) from the plan thickness, the area **represented by the test** shall be removed and replaced at the Contractor's expense or shall be permitted to remain in-place at an adjusted payment of 75% of the contract unit price.

METHOD OF MEASUREMENT

306-7.1 The quantity of lean concrete base course will be determined by the number of square yard of lean concrete actually constructed and accepted by the RPR as complying with the plans and specifications.

BASIS OF PAYMENT

306-8.1 The accepted quantities of lean concrete will be paid for at the contract unit price per square yard (m^2) for lean concrete base. The price and payment shall be full compensation for furnishing and placing all materials, provided; however, for any pavement found deficient in thickness as specified in paragraph 306-6.2b, the reduced unit price shall be paid.

Item P-306-8.1	Payment will be made for Lean Concrete Base Course, 10-Inch - per square yard.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates

ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C150	Standard Specification for Portland Cement
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C174	Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Specification for Coal Fly Ash and Raw and Calcined Natural Pozzolans for Use in Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregates (Accelerated Mortar-Bar Method)
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T136	Standard Method of Test for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
ASTM D3665	Standard Practice for Random Sampling of Construction Materials

American Concrete Institute (ACI)

ACI 305R	Guide to Hot Weather Concreting
ACI 306R	Guide to Cold Weather Concreting

END OF ITEM P-306

Item P-403 Asphalt Mix Pavement Surface Course

DESCRIPTION

403-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

403-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum for surface, asphalt binder, and leveling course Loss: 50% maximum for base course	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds (27200 kg) or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg): Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles with a value of 5:1 [2]	ASTM D4791
Bulk density of slag[3]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29.

[1] The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

[2] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

[3] Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	0 to 15% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate, and ASTM C183 shall be used in sampling mineral filler.

403-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

403-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 64-28.

403-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

403-3.1 Composition of mixture. The asphalt plant mix shall be composed of a mixture of well-graded aggregate, filler and anti-strip agent if required, and asphalt binder. The several aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

403-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF, and listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

403-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 403-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. Samples shall be prepared and compacted using a Marshall compactor in accordance with ASTM D6926.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The submitted JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 403-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 403-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 403-2.1 and 403-2.2.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each course and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles**,** elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows or gyrations.
- Laboratory mixing and compaction temperatures.
- Supplier recommended mixing and compaction temperatures.
- Plot of the combined gradation on the 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows/gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
TSR[1]	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA)[2]	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

[1] Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

[2] AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply, be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve
1 inch (25.0 mm)	**100**
3/4 inch (19.0 mm)	**90-100**
1/2 inch (12.5 mm)	**68-88**
3/8 inch (9.5 mm)	**60-82**
No. 4 (4.75 mm)	**45-67**
No. 8 (2.36 mm)	**32-54**
No. 16 (1.18 mm)	**22-44**
No. 30 (600 µm)	**15-35**
No. 50 (300 µm)	**9-25**
No. 100 (150 µm)	**6-18**
No. 200 (75 µm)	**3-6**
Voids in Mineral Aggregate (VMA)[1]	**14**
Asphalt Percent:	
Stone or gravel	**4.5-7.0**
Slag	**5.0-7.5**
Recommended Minimum Construction Lift Thickness	**3 inch**

[1]To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

403-3.4 Reclaimed Asphalt Pavement (RAP). Reclaimed asphalt pavement shall consist of reclaimed asphalt pavement (RAP), coarse aggregate, fine aggregate, mineral filler, and asphalt. Recycled asphalt shingles (RAS) shall not be allowed. The RAP shall be of a consistent gradation and asphalt content and properties. When RAP is fed into the plant, the maximum RAP chunk size shall not exceed 1-1/2 inches (38 mm). The reclaimed asphalt mix shall be designed using procedures contained in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition. The percentage of asphalt in the RAP shall be established for the mixture design according to ASTM D2172 using the appropriate dust correction procedure. The JMF shall meet the requirements of paragraph 403-3.3. RAP should only be used for shoulder surface course mixes and for any intermediate courses. The use of RAP containing Coal Tar shall not be allowed. Coal Tar surface treatments must be removed prior to recycling underlying asphalt material. The amount of RAP shall be limited to 30 percent.

In addition to the requirements of paragraph 403-3.3, the JMF shall indicate the percent of reclaimed asphalt pavement and the percent and grade of new asphalt binder.

For the PG graded asphalt binder selected in paragraph 403-2.3, adjust as follows:

a. For 0-20% RAP, there is no change in virgin asphalt binder content.

b. For >20 to 30% RAP, select asphalt binder one grade softer, i.e., PG 64-22 would soften to PG 58-28.

403-3.5 Control strip. A control strip is not required.

CONSTRUCTION METHODS

403-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	Degrees F	Degrees C
3 inches (7.5 cm) or greater	40	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

403-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items:

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

403-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

403-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

403-4.4.1 Material transfer vehicle (MTV). A material transfer vehicle is not required.

403-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and

grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.11.

403-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

403-4.6.1 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall also supply a qualified technician during all paving operations to calibrate the density gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

403-4.7 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt material to the mixer at a uniform temperature. The temperature of the unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

403-4.8 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

403-4.9 Preparation of asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and introduced into the mixer in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

403-4.10 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

403-4.11 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2e before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 10 feet (m) except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m).On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

403-4.12 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot

mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed**.**

403-4.13 Joints. The formation of all joints shall be made in such a manner as to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which are have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. An asphalt tack coat or other product approved by the RPR shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

403-4.14 Saw-cut grooving. Saw-cut grooving is not required.

403-4.15 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a minimum of 55 to 60 blades per 12 inches (300 mm) of cutting head width; grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that causes ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted.

Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

403-4.16 Nighttime Paving Requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR

prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

403-5.1 General. The Contractor shall develop a CQCP in accordance with Item C-100. No partial payment will be made for materials that are subject to specific QC requirements without an approved CQCP.

403-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

403-5.3 Quality Control (QC) testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP**.**

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ASTM D5444 and ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content of the asphalt shall be determined once per lot in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per lot, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m)

straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using the FAA profile program, ProFAA, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements will be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests will be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 403-4.15 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3) Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to the placement of the first lift and then prior to and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR by the end of the following working day.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 403-4.15.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ½ inch and replacing with new material. Skin patching is not allowed.

403-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

403-5.5 Control charts. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day shall be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the JMF target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts for range shall be established to control process variability for the test parameters and Suspension Limits listed below. The range shall be computed for each lot as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Control Chart Limits Based on Range
(n = 2)

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	3.5%
Asphalt Content	0.8%

c. Corrective action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain sets of rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two points in a row fall outside the Action Limit line for individual measurements.

403-5.6 Quality control (QC) reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with the CQCP described in Item C-100.

MATERIAL ACCEPTANCE

403-6.1. Quality Assurance Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality Assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot Size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of compacted specimens prepared in accordance with ASTM D6926.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inches (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot which contains a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

403-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, grade and Profilograph smoothness

b. Air voids. Acceptance of each lot of plant produced material for air voids will be based upon the average air void from the sublots. If the average air voids of the lot are equal to or greater than 2% and equal to or less than 5%, then the lot will be acceptable. If the average is below 2% or greater than 5%, the lot shall be removed and replaced at the Contractor's expense.

c. Mat density. Acceptance of each lot of plant produced material for mat density will be based on the average of all of the densities taken from the sublots. If the average mat density of the lot so established equals or exceeds 94%, the lot will be acceptable. If the average mat density of the lot is below 94%, the lot shall be removed and replaced at the Contractor's expense.

d. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the average of all of the joint densities taken from the sublots. If the average joint density of the lot so

established equals or exceeds 92%, the lot will be acceptable. If the average joint density of the lot is less than 92%, the Contractor shall stop production and evaluate the method of compacting joints. Production may resume once the reason for poor compaction has been determined and appropriate measures have been taken to ensure proper compaction.

e. Grade. The final finished surface of the pavement of the completed project shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot (15-m) longitudinal spacing and at all longitudinal grade breaks. Minimum cross-section grade points shall include grade at edge of runway pavement and tie in to shoulder.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

f. Profilograph roughness for QA Acceptance. The final profilograph shall be the full length of the project to facilitate testing of roughness between lots. The Contractor, in the presence of the RPR shall perform a profilograph roughness test on the completed project with a profilograph meeting the requirements of ASTM E1274 or a Class I inertial profiler meeting ASTM E950. Data and results shall be provided within 48 hrs of profilograph roughness tests.

The pavement shall have an average profile index less than 15 inches per mile per 1/10 mile. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must grind" bumps and the Profile Index for the pavement using a 0.2-inch (5 mm) blanking band. The bump template must span one inch (25 mm) with an offset of 0.4 inches (10 mm). The profilograph must be calibrated prior to use and operated by a factory or State DOT approved, trained operator. Profilograms shall be recorded on a longitudinal scale of one inch (25 mm) equals 25 feet (7.5 m) and a vertical scale of one inch (25 mm) equals one inch (25 mm). Profilograph shall be performed one foot right and left of project centerline and 15 feet (4.5 m) right and left of project centerline. Any areas that indicate "must grind" shall be corrected with diamond grinding per paragraph 401-4.15 or by removing and replacing full depth of surface course. as directed by the RPR. Where corrections are necessary, a second profilograph run shall be performed to verify that the corrections produced an average profile index of 15 inches per mile per 1/10 mile or less.

403-6.3 Resampling Pavement for Mat Density.

a. General. Resampling of a lot of pavement will only be allowed for mat density and then, only if the Contractor requests same in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 403-6.1. Only one resampling per lot will be permitted.

(1) A redefined mat density will be calculated for the resampled lot. The number of tests used to calculate the redefined mat density will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined mat density for a resampled lot will be used to evaluate the acceptance of that lot in accordance with paragraph 403-6.2.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and density determined using the remaining test values.

METHOD OF MEASUREMENT

403-7.1 Measurement. Plant mix asphalt mix pavement shall be measured by the number of tons (kg) of asphalt pavement used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

403-8.1 Payment. Payment for a lot of asphalt mixture meeting all acceptance criteria as specified in paragraph 403-6.2 shall be made at the contract unit price per ton (kg) for asphalt. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-403-8.1 Asphalt Mixture Surface Course - per ton

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C183	Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction

ASTM D979	Standard Practice for Sampling Bituminous Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
ASTM D1074	Standard Test Method for Compressive Strength of Bituminous Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4125	Standard Test Methods for Asphalt Content of Bituminous mixtures by the Nuclear Method
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5581	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen)
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate

ASTM D6307	Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)

Asphalt Institute (AI)

MS-2	Mix Design Manual, 7th Edition
MS-26	Asphalt Binder Handbook AI State Binder Specification Database

FAA Orders

5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder program

Software

FAARFIELD

END OF ITEM P-403

Item P-501 Cement Concrete Pavement

DESCRIPTION

501-1.1 This work shall consist of pavement composed of cement concrete with reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross-sections shown on the plans. The terms cement concrete, hydraulic cement concrete, and concrete are interchangeable in this specification.

MATERIALS

501-2.1 Aggregates.

a. Reactivity. Fine and Coarse aggregates to be used in PCC on this project shall be tested and evaluated by the Contractor for alkali-aggregate reactivity in accordance with both ASTM C1260 and ASTM C1567. Tests must be representative of aggregate sources which will be providing material for production. ASTM C1260 and ASTM C1567 tests may be run concurrently.

(1) Coarse aggregate and fine aggregate shall be tested separately in accordance with ASTM C1260, however, the length of test shall be extended to 28 days (30 days from casting). Tests must have been completed within 6 months of the date of the concrete mix submittal.

(2) The combined coarse and fine aggregate shall be tested in accordance with ASTM C1567, modified for combined aggregates, using the proposed mixture design proportions of aggregates, cementitious materials, and/or specific reactivity reducing chemicals. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

(3) If lithium nitrate is proposed for use with or without supplementary cementitious materials, the aggregates shall be tested in accordance with Corps of Engineers (COE) Concrete Research Division (CRD) C662 in lieu of ASTM C1567. If lithium nitrate admixture is used, it shall be nominal 30% ±0.5% weight lithium nitrate in water. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

b. Fine aggregate. Grading of the fine aggregate, as delivered to the mixer, shall conform to the requirements of ASTM C33 and the parameters identified in the fine aggregate material requirements below. Fine aggregate material requirements and deleterious limits are shown in the table below.

Fine Aggregate Material Requirements		
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Sand Equivalent	45 minimum	ASTM D2419
Fineness Modulus (FM)	$2.50 \leq FM \leq 3.40$	ASTM C136
Limits for Deleterious Substances in Fine Aggregate for Concrete		
Clay lumps and friable particles	1.0% maximum	ASTM C142
Coal and lignite	0.5% using a medium with a density of Sp. Gr. of 2.0	ASTM C123
Total Deleterious Material	1.0% maximum	

c. Coarse aggregate. The maximum size coarse aggregate shall be 1 inch.

Aggregates delivered to the mixer shall be clean, hard, uncoated aggregates consisting of crushed stone, crushed or uncrushed gravel, air-cooled iron blast furnace slag, crushed recycled concrete pavement, or a combination. The aggregates shall have no known history of detrimental pavement staining. Steel blast furnace slag shall not be permitted. Coarse aggregate material requirements and deleterious limits are shown in the table below; washing may be required to meet aggregate requirements.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 for any size group coarser than 3/8 (9.5 mm) sieve [1]	ASTM D4791
Bulk density of slag [2]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29
D-cracking (Freeze-Thaw)[3]	Durability factor ≥ 95	ASTM C666

[1] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

[2] Only required if slag is specified.

[3] Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

The amount of deleterious material in the coarse aggregate shall not exceed the following limits:

Limits for Deleterious Substances in Coarse Aggregate

Deleterious material	ASTM	Percentage by Mass
Clay Lumps and friable particles	ASTM C142	1.0
Material finer than No. 200 sieve (75 μm)	ASTM C117	1.0[1]
Lightweight particles	ASTM C123 using a medium with a density of Sp. Gr. of 2.0	0.5
Chert[2] (less than 2.40 Sp Gr.)	ASTM C123 using a medium with a density of Sp. Gr. of 2.40)	0.1[3]

[1] The limit for material finer than 75-μm is allowed to be increased to 1.5% for crushed aggregates consisting of dust of fracture that is essentially free from clay or shale. Test results supporting acceptance of increasing limit to 1.5% with statement indicating material is dust of fracture must be submitted with Concrete mix. Acceptable techniques to characterizing these fines include methylene blue adsorption or X-ray diffraction analysis.

[2] Chert and aggregates with less than 2.4 specific gravity.

[3] The limit for chert may be increased to 1.0 percent by mass in areas not subject to severe freeze and thaw.

d. Combined aggregate gradation. This specification is targeted for a combined aggregate gradation developed following the guidance presented in United States Air Force Engineering Technical Letter (ETL) 97-5: Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements. Base the aggregate grading upon a combination of all the aggregates (coarse and fine) to be used for the mixture proportioning. Three aggregate sizes may be required to achieve an optimized combined gradation that will produce a workable concrete mixture for its intended use. Use aggregate gradations that produce concrete mixtures with well-graded or optimized aggregate combinations. The Contractor shall submit complete mixture information necessary to calculate the volumetric components of the mixture. The combined aggregate grading shall meet the following requirements:

(1) The materials selected and the proportions used shall be such that when the Coarseness Factor (CF) and the Workability Factor (WF) are plotted on a diagram as described in paragraph 501-2.1d(4) below, the point thus determined shall fall within the parallelogram described therein.

(2) The CF shall be determined from the following equation:

CF = (cumulative percent retained on the 3/8 in. (9.5 mm) sieve)(100) / (cumulative percent retained on the No. 8 (2.36 mm) sieve)

(3) The WF is defined as the percent passing the No. 8 (2.36 mm) sieve based on the combined gradation. However, WF shall be adjusted, upwards only, by 2.5 percentage points for each 94 pounds (42 kg) of cementitious material per cubic meter yard greater than 564 pounds per cubic yard (335 kg per cubic meter).

(4) A diagram shall be plotted using a rectangular scale with WF on the Y-axis with units from 20 (bottom) to 45 (top), and with CF on the X-axis with units from 80 (left side) to 30 (right side). On this diagram a parallelogram shall be plotted with corners at the following coordinates (CF-75, WF-28), (CF-75, WF-40), (CF-45, WF-32.5), and (CF-45, WF-44.5). If the point determined by the intersection of the computed CF and WF does not fall within the above parallelogram, the grading of each size of aggregate used and the proportions selected shall be changed as necessary. The point determined by the plotting of

the CF and WF may be adjusted during production ±3 WF and ±5 CF. Adjustments to gradation may not take the point outside of the parallelogram.

e. Contractors combined aggregate gradation. The Contractor shall submit their combined aggregate gradation using the following format:

Contractor's Combined Aggregate Gradation

Sieve Size	Contractor's Concrete mix Gradation (Percent passing by weight)
2 inch (50 mm)	*
1-1/2 inch (37.5 mm)	*
1 inch (25.0 mm)	*
3/4 inch (19.0 mm)	*
1/2 inch (12.5 mm)	*
3/8 inch (9.5 mm)	*
No. 4 (4.75 mm)	*
No. 8 (2.36 mm)	*
No. 16 (1.18 mm)	*
No. 30 (600 µm)	*
No. 50 (300 µm)	*
No. 100 (150 µm)	*

501-2.2 Cement. Cement shall conform to the requirements of ASTM C150 Type 1.

501-2.3 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total alkali content less than 3% per ASTM C311. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the Resident Project Representative (RPR).

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

c. Raw or calcined natural pozzolan. Natural pozzolan shall be raw or calcined and conform to ASTM C618, Class N, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and shall have a loss on ignition not exceeding 6%. Class N pozzolan for use in mitigating Alkali-Silica Reactivity shall have a total available alkali content less than 3%.

501-2.4 Joint seal. The joint seal for the joints in the concrete pavement shall meet the requirements of Item P-605 and shall be of the type specified in the plans.

501-2.5 Isolation joint filler. Premolded joint filler for isolation joints shall conform to the requirements of ASTM D1751 or ASTM D1752 and shall be where shown on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the RPR. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the RPR.

501-2.6 Steel reinforcement. Reinforcing shall conform to the following requirements:

ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A706 Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

ASTM A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars

ASTM A934 Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars

ASTM A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

ASTM A184 or A704 Bar mats

Welded wire fabric shall be furnished in flat sheets only.

501-2.7 Dowel and tie bars. Dowel bars shall be plain steel bars conforming to ASTM A615 and shall be free from burring or other deformation restricting slippage in the concrete.

a. Dowel Bars. Before delivery to the construction site each dowel bar shall be epoxy coated per ASTM A1078, Type 1, with a coating thickness after curing greater than 10 mils. Patched ends are not required for Type 1 coated dowels. The dowels shall be coated with a bond-breaker recommended by the manufacturer. Dowel sleeves or inserts are not permitted. Grout retention rings shall be fully circular metal or plastic devices capable of supporting the dowel until the grout hardens.

b. Tie Bars. Tie bars shall be deformed steel bars and conform to the requirements of ASTM A615. Tie bars designated as Grade 60 in ASTM A615 or ASTM A706 shall be used for construction requiring bent bars.

501-2.8 Water. Water used in mixing or curing shall be potable. If water is taken from other sources considered non-potable, it shall meet the requirements of ASTM C1602.

501-2.9 Material for curing concrete. Curing materials shall conform to one of the following specifications:

a. Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C309, Type 2, Class A, or Class B.

b. White polyethylene film for curing concrete shall conform to the requirements of ASTM C171.

c. White burlap-polyethylene sheeting for curing concrete shall conform to the requirements of ASTM C171.

d. Waterproof paper for curing concrete shall conform to the requirements of ASTM C171.

501-2.10 Admixtures. Admixtures shall conform to the following specifications:

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entraining agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D.

c. Other admixtures. The use of set retarding and set-accelerating admixtures shall be approved by the RPR prior to developing the concrete mix. Retarding admixtures shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating admixtures shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

d. Lithium Nitrate. The lithium admixture shall be a nominal 30% aqueous solution of Lithium Nitrate, with a density of 10 pounds/gallon (1.2 kg/L), and shall have the approximate chemical form as shown below:

Lithium Admixture

Constituent	Limit (Percent by Mass)
LiNO3 (Lithium Nitrate)	30 ±0.5
SO4 (Sulfate Ion)	0.1 (max)
Cl (Chloride Ion)	0.2 (max)
Na (Sodium Ion)	0.1 (max)
K (Potassium Ion)	0.1 (max)

The lithium nitrate admixture dispensing and mixing operations shall be verified and certified by the lithium manufacturer's representative.

501-2.11 Epoxy-resin. All epoxy-resin materials shall be two-component materials conforming to the requirements of ASTM C881, Class as appropriate for each application temperature to be encountered, except that in addition, the materials shall meet the following requirements:

a. Material for use for embedding dowels and anchor bolts shall be Type IV, Grade 3.

b. Material for use as patching materials for complete filling of spalls and other voids and for use in preparing epoxy resin mortar shall be Type III, Grade as approved.

c. Material for use for injecting cracks shall be Type IV, Grade 1.

d. Material for bonding freshly mixed Portland cement concrete or mortar or freshly mixed epoxy resin concrete or mortar to hardened concrete shall be Type V, Grade as approved.

501-2.12 Bond Breaker. Bond breaker material shall be as specified in Section P-403 and as shown in the plans.

CONCRETE MIX

501-3.1. General. No concrete shall be placed until an acceptable concrete mix has been submitted to the RPR for review and the RPR has taken appropriate action. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

501-3.2 Concrete Mix Laboratory. The laboratory used to develop the concrete mix shall be accredited in accordance with ASTM C1077. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the concrete mix must be included in the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

501-3.3 Concrete Mix Proportions. Develop the mix using the procedures contained in Portland Cement Association (PCA) publication, "Design and Control of Concrete Mixtures." Concrete shall be proportioned to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-6.6 for a flexural strength of 650 psi per ASTM C78.

The minimum cementitious material shall be adequate to ensure a workable, durable mix. The minimum cementitious material (cement plus fly ash, or slag cement) shall be 517 pounds per cubic yard. The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall be between 0.38 – 0.45 by weight.

Flexural strength test specimens shall be prepared in accordance with ASTM C192 and tested in accordance with ASTM C78. At the start of the project, the Contractor shall determine an allowable slump as determined by ASTM C143 not to exceed 2 inches (50 mm) for slip-form placement. For fixed-form placement, the slump shall not exceed 3 inches (75 mm). For hand placement, the slump shall not exceed 4 inches (100 mm).

The results of the concrete mix shall include a statement giving the maximum nominal coarse aggregate size and the weights and volumes of each ingredient proportioned on a one cubic yard (meter) basis. Aggregate quantities shall be based on the mass in a saturated surface dry condition.

If a change in source(s) is made, or admixtures added or deleted from the mix, a new concrete mix must be submitted to the RPR for approval.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

501-3.4 Concrete Mix submittal. The concrete mix shall be submitted to the RPR at least 30 days prior to the start of operations. The submitted concrete mix shall not be more than 180 days old and must use the materials to be used for production for the project. Production shall not begin until the concrete mix is approved in writing by the RPR.

Each of the submitted concrete mixes (i.e, slip form, side form machine finish and side form hand finish) shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items and quantities as a minimum:

- Certified material test reports for aggregate in accordance with paragraph 501-2.1. Certified reports must include all tests required; reporting each test, test method, test result, and requirement specified (criteria).
- Combined aggregate gradations and analysis; and including plots of the fine aggregate fineness modulus.
- Reactivity Test Results.
- Coarse aggregate quality test results, including deleterious materials.
- Fine aggregate quality test results, including deleterious materials.
- Mill certificates for cement and supplemental cementitious materials.
- Certified test results for all admixtures, including Lithium Nitrate if applicable.

- Specified flexural strength, slump, and air content.
- Recommended proportions/volumes for proposed mixture and trial water-cementitious materials ratio, including actual slump and air content.
- Flexural and compressive strength summaries and plots, including all individual beam and cylinder breaks.
- Correlation ratios for acceptance testing and Contractor QC testing, when applicable.
- Historical record of test results documenting production standard deviation, when applicable.

501-3.5 Cementitious materials.

a. Fly ash. When fly ash is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If fly ash is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement may be used. The slag cement, or slag cement plus fly ash if both are used, may constitute between 25 to 55% of the total cementitious material by weight.

c. Raw or calcined natural pozzolan. Natural pozzolan may be used in the concrete mix. When pozzolan is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If pozzolan is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

501-3.6 Admixtures.

a. Air-entraining admixtures. Air-entraining admixture are to be added in such a manner that will ensure uniform distribution of the agent throughout the batch. The air content of freshly mixed air-entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the mix shall be 6.0%. Air content shall be determined by testing in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag and other highly porous coarse aggregate.

b. Water-reducing admixtures. Water-reducing admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

c. Other admixtures. Set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

d. Lithium nitrate. Lithium nitrate shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements in accordance with paragraph 501-2.10d.

CONSTRUCTION METHODS

501-4.1 Control Strip. The control strip(s) shall be to the next planned joint after the initial 250 feet (75 m) of each type of pavement construction (slip-form pilot lane, slip-form fill-in lane, or fixed form). The

Contractor shall demonstrate, in the presence of the RPR, that the materials, concrete mix, equipment, construction processes, and quality control processes meet the requirements of the specifications. The concrete mixture shall be extruded from the paver meeting the edge slump tolerance and with little or no finishing. Pilot, fill-in, and fixed-form control strips will be accepted separately. Minor adjustments to the mix design may be required to place an acceptable control strip. The production mix will be the adjusted mix design used to place the acceptable control strip. Upon acceptance of the control strip by the RPR, the Contractor must use the same equipment, materials, and construction methods for the remainder of concrete paving. Any adjustments to processes or materials must be approved in advance by the RPR. Acceptable control strips will meet edge slump tolerance and surface acceptable with little or no finishing, air content within action limits, strength equal or greater than requirements of P501-3.3. The control strip will be considered one lot for payment (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 501-8.1 using a lot pay factor equal to 100.

501-4.2 Equipment. The Contractor is responsible for the proper operation and maintenance of all equipment necessary for handling materials and performing all parts of the work to meet this specification.

a. Plant and equipment. The plant and mixing equipment shall conform to the requirements of ASTM C94 and/or ASTM C685. Each truck mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades. The truck mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch (19 mm) or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

Equipment for transferring and spreading concrete from the transporting equipment to the paving lane in front of the finishing equipment shall be provided. The equipment shall be specially manufactured, self-propelled transfer equipment which will accept the concrete outside the paving lane and will spread it evenly across the paving lane in front of the paver and strike off the surface evenly to a depth which permits the paver to operate efficiently.

b. Finishing equipment.

(1) Slip-form. The standard method of constructing concrete pavements shall be with an approved slip-form paving equipment designed and operated to spread, consolidate, screed, and finish the freshly placed concrete in one complete pass of the machine so that the end result is a dense and homogeneous pavement which is achieved with a minimum of hand finishing. The paver-finisher shall be a heavy duty, self-propelled machine designed specifically for paving and finishing high quality concrete pavements.

(2) Fixed-form. On projects requiring less than 10,000 cubic yards of concrete pavement or irregular areas at locations inaccessible to slip-form paving equipment, concrete pavement may be placed with equipment specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR. Hand screeding and float finishing may only be used on small irregular areas as allowed by the RPR.

c. Vibrators. Vibrator shall be the internal type. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation or voids. The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement and meet the recommendations of American Concrete Institute (ACI) 309R, Guide for Consolidation of Concrete. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases. The Contractor shall provide an electronic or mechanical

means to monitor vibrator status. The checks on vibrator status shall occur a minimum of two times per day or when requested by the RPR.

Hand held vibrators may only be used in irregular areas and shall meet the recommendations of ACI 309R, Guide for Consolidation of Concrete.

d. Concrete saws. The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

e. Fixed forms. Straight side fixed forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built-up forms shall not be used, except as approved by the RPR. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the RPR. The forms shall extend the full depth of the pavement section.

501-4.3 Form setting. Forms shall be set to line and grade as shown on the plans, sufficiently in advance of the concrete placement, to ensure continuous paving operation. Forms shall be set to withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the concrete placement.

501-4.4 Base surface preparation prior to placement. Any damage to the prepared base, subbase, and subgrade shall be corrected full depth by the Contractor prior to concrete placement. The underlying surface shall be entirely free of frost when concrete is placed. The prepared grade shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from concrete. Bond breaker shall be applied in accordance with P-403.

501-4.5 Handling, measuring, and batching material. Aggregate stockpiles shall be constructed and managed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Store and maintain all aggregates at a uniform moisture content prior to use. A continuous supply of materials shall be provided to the work to ensure continuous placement.

501-4.6 Mixing concrete. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials are placed into the drum until the drum is emptied into the truck. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C94 or ASTM C685.

Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or non-agitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is discharged from the truck should not exceed 30 minutes when the concrete is hauled in non-agitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. In no case shall the temperature of the concrete when placed exceed 90°F (32°C). Retempering concrete by adding water or by other means will not be permitted. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements

provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified is not exceeded.

501-4.7 Weather Limitations on mixing and placing. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold weather. Unless authorized in writing by the RPR, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F (4°C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F (2°C).

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50°F (10°C) at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150°F (66°C). The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

Curing during cold weather shall be in accordance with paragraph 501-4.13d.

b. Hot weather. During periods of hot weather when the maximum daily air temperature exceeds 85°F (30°C), the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90°F (32°C). The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The concrete placement shall be protected from exceeding an evaporation rate of 0.2 psf (0.98 kg/m^2 per hour) per hour. When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. If the Contractor's measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

Curing during hot weather shall be in accordance with paragraph 501-4.13e.

c. Temperature management program. Prior to the start of paving operation for each day of paving, the Contractor shall provide the RPR with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. (Federal Highway Administration HIPERPAV 3 is one example of a temperature management program.) As a minimum, the program shall address the following items:

(1) Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.

(2) Anticipated weather conditions such as ambient temperatures, wind velocity, and relative humidity; and anticipated evaporation rate using Figure 19-9, PCA, Design and Control of Concrete Mixtures.

(3) Anticipated timing of initial sawing of joint.

(4) Anticipated number and type of saws to be used.

d. **Rain.** The Contractor shall have available materials for the protection of the concrete during inclement weather. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The

sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.8 Concrete Placement. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet (1 m). The finished concrete product must be dense and homogeneous, without segregation and conforming to the standards in this specification. Backhoes and grading equipment shall not be used to distribute the concrete in front of the paver. Front end loaders will not be used. All concrete shall be consolidated without voids or segregation, including under and around all load-transfer devices, joint assembly units, and other features embedded in the pavement. Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a flexural strength of 550 psi, based on the average of four field cured specimens per 2,000 cubic yards (1,530 cubic meters) of concrete placed. The Contractor must determine that the above minimum strengths are adequate to protection the pavement from overloads due to the construction equipment proposed for the project.

The Contractor shall have available materials for the protection of the concrete during cold, hot and/or inclement weather in accordance with paragraph 501-4.7.

a. Slip-form construction. The concrete shall be distributed uniformly into final position by a self-propelled slip-form paver without delay. The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose. The paver shall vibrate the concrete for the full width and depth of the strip of pavement being placed and the vibration shall be adequate to provide a consistency of concrete that will stand normal to the surface with sharp well-defined edges. The sliding forms shall be rigidly held together laterally to prevent spreading of the forms. The plastic concrete shall be effectively consolidated by internal vibration with transverse vibrating units for the full width of the pavement and/or a series of equally placed longitudinal vibrating units. The space from the outer edge of the pavement to longitudinal unit shall not exceed 9 inches (23 cm) for slipform and at the end of the dowels for the fill-in lanes. The spacing of internal units shall be uniform and shall not exceed 18 inches (0.5 m).

The term internal vibration means vibrating units located within the specified thickness of pavement section.

The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without, segregation, voids, or vibrator trails and the amplitude of vibration shall be sufficient to be perceptible on the surface of the concrete along the entire length of the vibrating unit and for a distance of at least one foot (30 cm). The frequency of vibration or amplitude should be adjusted proportionately with the rate of travel to result in a uniform density and air content. The paving machine shall be equipped with a tachometer or other suitable device for measuring and indicating the actual frequency of vibrations.

The concrete shall be held at a uniform consistency. The slip-form paver shall be operated with as nearly a continuous forward movement as possible and all operations of mixing, delivering, and spreading concrete shall be coordinated to provide uniform progress with stopping and starting of the paver held to a minimum. If for any reason, it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately. No tractive force shall be applied to the machine, except that which is controlled from the machine.

When concrete is being placed adjacent to an existing pavement, that part of the equipment which is supported on the existing pavement shall be equipped with protective pads on crawler tracks or rubber-tired wheels on which the bearing surface is offset to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

Not more than 15% of the total free edge of each 500-foot (150 m) segment of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch (6 mm), and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch (9 mm). (The total free edge of 500 feet (150 m) of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; that is, 500 feet (150 m) of paving lane originally constructed as a separate lane will have 1,000 feet (300 m) of free edge, 500 feet (150 m) of fill-in lane will have no free edge, etc.). The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches (0.5 m) from the edge.

When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump will be removed the full width of the slip form lane and replaced at the expense of the Contractor as directed by the RPR.

b. Fixed-form construction. Forms shall be drilled in advance of being placed to line and grade to accommodate tie bars / dowel bars where these are specified.

Immediately in advance of placing concrete and after all subbase operations are completed, side forms shall be trued and maintained to the required line and grade for a distance sufficient to prevent delay in placing.

Side forms shall remain in place at least 12 hours after the concrete has been placed, and in all cases until the edge of the pavement no longer requires the protection of the forms. Curing compound shall be applied to the concrete immediately after the forms have been removed.

Side forms shall be thoroughly cleaned and coated with a release agent each time they are used and before concrete is placed against them.

Concrete shall be spread, screed, shaped and consolidated by one or more self-propelled machines. These machines shall uniformly distribute and consolidate concrete without segregation so that the completed pavement will conform to the required cross-section with a minimum of handwork.

The number and capacity of machines furnished shall be adequate to perform the work required at a rate equal to that of concrete delivery. The equipment must be specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR.

Concrete for the full paving width shall be effectively consolidated by internal vibrators. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation, voids, or leaving vibrator trails.

Power to vibrators shall be connected so that vibration ceases when forward or backward motion of the machine is stopped.

c. Consolidation. Concrete shall be consolidated with the specified type of lane-spanning, gang-mounted, mechanical, immersion type vibrating equipment mounted in front of the paver, supplemented, in rare instances as specified, by hand-operated vibrators. The vibrators shall be inserted into the concrete to a depth that will provide the best full-depth consolidation but not closer to the underlying material than 2 inches (50 mm). Vibrators shall not be used to transport or spread the concrete. For each paving train, at least one additional vibrator spud, or sufficient parts for rapid replacement and repair of vibrators shall be maintained at the paving site at all times. Any evidence of inadequate consolidation (honeycomb along the edges, large air pockets, or any other evidence) or over-consolidation (vibrator trails, segregation, or any other evidence) shall require the immediate stopping of the paving operation and adjustment of the equipment or procedures as approved by the RPR.

If a lack of consolidation of the hardened concrete is suspected by the RPR, referee testing may be required. Referee testing of hardened concrete will be performed by the RPR by cutting cores from the

finished pavement after a minimum of 24 hours curing. The RPR shall visually examine the cores for evidence of lack of consolidation. Density determinations will be made by the RPR based on the water content of the core as taken. ASTM C642 shall be used for the determination of core density in the saturated-surface dry condition. When required, referee cores will be taken at the minimum rate of one for each 500 cubic yards (382 m^2) of pavement, or fraction. The Contractor shall be responsible for all referee testing cost if they fail to meet the required density.

The average density of the cores shall be at least 97% of the original concrete mix density, with no cores having a density of less than 96% of the original concrete mix density. Failure to meet the referee tests will be considered evidence that the minimum requirements for vibration are inadequate for the job conditions. Additional vibrating units or other means of increasing the effect of vibration shall be employed so that the density of the hardened concrete conforms to the above requirements.

501-4.9 Strike-off of concrete and placement of reinforcement. Following the placing of the concrete, it shall be struck off to conform to the cross-section shown on the plans and to an elevation that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screed. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 Joints. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2-inch (12 mm) from their designated position and shall be true to line with not more than 1/4-inch (6 mm) variation in 10 feet (3 m). The surface across the joints shall be tested with a 12-foot (3 m) straightedge as the joints are finished and any irregularities in excess of 1/4 inch (6 mm) shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

a. Construction. Longitudinal construction joints shall be slip-formed or formed against side forms as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

b. Contraction. Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be

finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans.

c. Isolation (expansion). Isolation joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint. The filler shall be fastened uniformly along the hardened joint face with no buckling or debris between the filler and the concrete interface, including a temporary filler for the sealant reservoir at the top of the slab. The edges of the joint shall be finished and tooled while the concrete is still plastic

d. Dowels and Tie Bars for Joints

(1) Tie bars. Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth and within the tolerances in paragraph 501-4.10(f.). When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. Tie bars shall not be painted, greased, or enclosed in sleeves. When slip-form operations call for tie bars, two-piece hook bolts can be installed.

(2) Dowel bars. Dowel bars shall be placed across joints in the proper horizontal and vertical alignment as shown on the plans. The dowels shall be coated with a bond-breaker or other lubricant recommended by the manufacturer and approved by the RPR. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.

(3) Placing dowels and tie bars. Horizontal spacing of dowels shall be within a tolerance of ±3/4 inch (19 mm). The vertical location on the face of the slab shall be within a tolerance of ±1/2 inch (12 mm). The method used to install dowels shall ensure that the horizontal and vertical alignment will not be greater than 1/4 inch per feet (6 mm per 0.3 m), except for those across the crown or other grade change joints. Dowels across crowns and other joints at grade changes shall be measured to a level surface. Horizontal alignment shall be checked perpendicular to the joint edge. The portion of each dowel intended to move within the concrete or expansion cap shall be wiped clean and coated with a thin, even film of lubricating oil or light grease before the concrete is placed. Dowels shall be installed as specified in the following subparagraphs.

(a) Contraction joints. Dowels and tie bars in longitudinal and transverse contraction joints within the paving lane shall be held securely in place by means of rigid metal frames or basket assemblies of an approved type. The basket assemblies shall be held securely in the proper location by means of suitable pins or anchors. Do not cut or crimp the dowel basket tie wires.

At the Contractor's option, dowels and tie bars in contraction joints may be installed by insertion into the plastic concrete using approved equipment and procedures per the paver manufacturer's design. Approval of installation methods will be based on the results of the control strip showing that the dowels and tie bars are installed within specified tolerances as verified by cores or non-destructive rebar location devices approved by the RPR.

(b) Construction joints. Install dowels and tie bars by the cast-in- place or the drill-and-dowel method. Installation by removing and replacing in preformed holes will not be permitted. Dowels and tie bars shall be prepared and placed across joints where indicated, correctly aligned, and securely held in the proper horizontal and vertical position during placing and finishing operations, by means of devices fastened to the forms.

(c) Joints in hardened concrete. Install dowels in hardened concrete by bonding the dowels into holes drilled into the concrete. The concrete shall have cured for seven (7) days or reached a

minimum flexural strength of 450 psi before drilling begins. Holes 1/8 inch (3 mm) greater in diameter than the dowels shall be drilled into the hardened concrete using rotary-core drills. Rotary-percussion drills may be used, provided that excessive spalling does not occur. Spalling beyond the limits of the grout retention ring will require modification of the equipment and operation. Depth of dowel hole shall be within a tolerance of ±1/2 inch (12 mm) of the dimension shown on the drawings. On completion of the drilling operation, the dowel hole shall be blown out with oil-free, compressed air. Dowels shall be bonded in the drilled holes using epoxy resin. Epoxy resin shall be injected at the back of the hole before installing the dowel and extruded to the collar during insertion of the dowel so as to completely fill the void around the dowel. Application by buttering the dowel will not be permitted. The dowels shall be held in alignment at the collar of the hole by means of a suitable metal or plastic grout retention ring fitted around the dowel.

e. Sawing of joints. Sawing shall commence, without regard to day or night, as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of the pavement occurs and shall continue without interruption until all joints have been sawn. All slurry and debris produced in the sawing of joints shall be removed by vacuuming and washing. Curing compound or system shall be reapplied in the initial saw-cut and maintained for the remaining cure period.

Joints shall be cut in locations as shown on the plans. The initial joint cut shall be a minimum 1/8 inch (3 mm) wide and to the depth shown on the plans. Prior to placement of joint sealant or seals, the top of the joint shall be widened by sawing as shown on the plans.

501-4.11 Finishing. Finishing operations shall be a continuing part of placing operations starting immediately behind the strike-off of the paver. Initial finishing shall be provided by the transverse screed or extrusion plate. The sequence of operations shall be transverse finishing, longitudinal machine floating if used, straightedge finishing, edging of joints, and then texturing. Finishing shall be by the machine method. The hand method shall be used only on isolated areas of odd slab widths or shapes and in the event of a breakdown of the mechanical finishing equipment. Supplemental hand finishing for machine finished pavement shall be kept to an absolute minimum. Any machine finishing operation which requires appreciable hand finishing, other than a moderate amount of straightedge finishing, shall be immediately stopped and proper adjustments made or the equipment replaced. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Compensation shall be made for surging behind the screeds or extrusion plate and settlement during hardening and care shall be taken to ensure that paving and finishing machines are properly adjusted so that the finished surface of the concrete (not just the cutting edges of the screeds) will be at the required line and grade. Finishing equipment and tools shall be maintained clean and in an approved condition. At no time shall water be added to the surface of the slab with the finishing equipment or tools, or in any other way. Fog (mist) sprays or other surface applied finishing aids specified to prevent plastic shrinkage cracking, approved by the RPR, may be used in accordance with the manufacturers requirements.

a. Machine finishing with slipform pavers. The slipform paver shall be operated so that only a very minimum of additional finishing work is required to produce pavement surfaces and edges meeting the specified tolerances. Any equipment or procedure that fails to meet these specified requirements shall immediately be replaced or modified as necessary. A self-propelled non-rotating pipe float may be used while the concrete is still plastic, to remove minor irregularities and score marks. Only one pass of the pipe float shall be allowed. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Remove excessive slurry from the surface with a cutting straightedge and wipe off the edge. Any slurry which does run down the vertical edges shall be immediately removed by hand, using stiff brushes or scrapers. No slurry, concrete or concrete mortar shall be used to build up along the

edges of the pavement to compensate for excessive edge slump, either while the concrete is plastic or after it hardens.

b. Machine finishing with fixed forms. The machine shall be designed to straddle the forms and shall be operated to screed and consolidate the concrete. Machines that cause displacement of the forms shall be replaced. The machine shall make only one pass over each area of pavement. If the equipment and procedures do not produce a surface of uniform texture, true to grade, in one pass, the operation shall be immediately stopped and the equipment, mixture, and procedures adjusted as necessary.

c. Other types of finishing equipment. Clary screeds, other rotating tube floats, or bridge deck finishers are not allowed on mainline paving, but may be allowed on irregular or odd-shaped slabs, and near buildings or trench drains, subject to the RPR's approval.

Bridge deck finishers shall have a minimum operating weight of 7500 pounds (3400 kg) and shall have a transversely operating carriage containing a knock-down auger and a minimum of two immersion vibrators. Vibrating screeds or pans shall be used only for isolated slabs where hand finishing is permitted as specified, and only where specifically approved.

d. Hand finishing. Hand finishing methods will not be permitted, except under the following conditions: (1) in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade and (2) in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical.

e. Straightedge testing and surface correction. After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a 12-foot (3.7-m) finishing straightedge swung from handles capable of spanning at least one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross-section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 Surface texture. The surface of the pavement shall be finished as designated below for all newly constructed concrete pavements. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. The texture shall be uniform in appearance and approximately 1/16 inch (2 mm) in depth. Any imperfections resulting from the texturing operation shall be corrected to the satisfaction of the RPR.

a . Brush or broom finish. Shall be applied when the water sheen has practically disappeared. The equipment shall operate transversely across the pavement surface.

b. Burlap drag finish. Burlap, at least 15 ounces per square yard (555 grams per square meter), will typically produce acceptable texture. To obtain a textured surface, the transverse threads of the burlap shall be removed approximately one foot (30 cm) from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface.

c. Artificial turf finish. Not used.

501-4.13 Curing. Immediately after finishing operations are completed and bleed water is gone from the surface, all exposed surfaces of the newly placed concrete shall be cured for a 7-day cure period in

accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

When a two-saw-cut method is used to construct the contraction joint, the curing compound shall be applied to the saw-cut immediately after the initial cut has been made. The sealant reservoir shall not be sawed until after the curing period has been completed. When the one cut method is used to construct the contraction joint, the joint shall be cured with wet rope, wet rags, or wet blankets. The rags, ropes, or blankets shall be kept moist for the duration of the curing period.

a. Impervious membrane method. Curing with liquid membrane compounds should not occur until bleed and surface moisture has evaporated. All exposed surfaces of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of one gallon (4 liters) to not more than 150 square feet (14 sq m). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application, the compound shall be stirred continuously by mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. When hand spraying is approved by the RPR, a double application rate shall be used to ensure coverage. Should the film become damaged from any cause, including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

b. White burlap-polyethylene sheets. Not used.

c. Water method. Not used.

d. Concrete protection for cold weather. Maintain the concrete at a temperature of at least 50°F (10°C) for a period of 72 hours after placing and at a temperature above freezing for the remainder of the 7-day curing period. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather; and any concrete damaged shall be removed and replaced at the Contractor's expense.

e. Concrete protection for hot weather. Concrete should be continuous moisture cured for the entire curing period and shall commence as soon as the surfaces are finished and continue for at least 24 hours. However, if moisture curing is not practical beyond 24 hours, the concrete surface shall be protected from drying with application of a liquid membrane-forming curing compound while the surfaces are still damp. Other curing methods may be approved by the RPR.

501-4.14 Removing forms. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured in accordance with paragraph 501-4.13.

If honeycombed areas are evident when the forms are removed, materials, placement, and consolidation methods must be reviewed and appropriate adjustments made to assure adequate consolidation at the edges of future concrete placements. Honeycombed areas that extend into the slab less than approximately 1 inch (25 mm), shall be repaired with an approved grout, as directed by the RPR. Honeycombed areas that extend into the slab greater than a depth of 1 inch (25 mm) shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-4.19.

501-4.15 S**aw-cut grooving.** If shown on the plans, grooved surfaces shall be provided in accordance with the requirements of Item P-621.

501-4.16 Sealing joints. The joints in the pavement shall be sealed in accordance with Item P-605.

501-4.17 Protection of pavement. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents until accepted by the RPR. This shall include watchmen to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense.

Aggregates, rubble, or other similar construction materials shall not be placed on airfield pavements. Traffic shall be excluded from the new pavement by erecting and maintaining barricades and signs until the concrete is at least seven (7) days old, or for a longer period if directed by the RPR.

In paving intermediate lanes between newly paved pilot lanes, operation of the hauling and paving equipment will be permitted on the new pavement after the pavement has been cured for seven (7) days, the joints are protected, the concrete has attained a minimum field cured flexural strength of 450 psi (3100 kPa), and the slab edge is protected.

All new and existing pavement carrying construction traffic or equipment shall be kept clean and spillage of concrete and other materials shall be cleaned up immediately.

Damaged pavements shall be removed and replaced at the Contractor's expense. Slabs shall be removed to the full depth, width, and length of the slab.

501-4.18 Opening to construction traffic. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C31 have attained a flexural strength of 450 pounds per square inch (3100 kPa) when tested in accordance with ASTM C78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction traffic, all joints shall either be sealed or protected from damage to the joint edge and intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

501-4.19 Repair, removal, or replacement of slabs. New pavement slabs that are broken or contain cracks or are otherwise defective or unacceptable as defined by acceptance criteria in paragraph 501-6.6 shall be removed and replaced or repaired, as directed by the RPR, at the Contractor's expense. Spalls along joints shall be repaired as specified. Removal of partial slabs is not permitted. Removal and replacement shall be full depth, shall be full width of the slab, and the limit of removal shall be normal to the paving lane and to each original transverse joint. The RPR will determine whether cracks extend full depth of the pavement and may require cores to be drilled on the crack to determine depth of cracking. Such cores shall be have a diameter of 2 inches (50 mm) to 4 inches (100 mm), shall be drilled by the Contractor and shall be filled by the Contractor with a well consolidated concrete mixture bonded to the walls of the hole with a bonding agent, using approved procedures. Drilling of cores and refilling holes shall be at no expense to the Owner. Repair of cracks as described in this section shall not be allowed if in the opinion of the RPR the overall condition of the pavement indicates that such repair is unlikely to achieve an acceptable and durable finished pavement. No repair of cracks shall be allowed in any panel that demonstrates segregated aggregate with an absence of coarse aggregate in the upper 1/8 inch (3 mm) of the pavement surface.

a. Shrinkage cracks. Shrinkage cracks which do not exceed one-third of the pavement depth shall be cleaned and either high molecular weight methacrylate (HMWM) applied; or epoxy resin (Type IV, Grade 1) pressure injected using procedures recommended by the manufacturer and approved by the RPR. Sandblasting of the surface may be required following the application of HMWM to restore skid

resistance. Care shall be taken to ensure that the crack is not widened during epoxy resin injection. All epoxy resin injection shall take place in the presence of the RPR. Shrinkage cracks which exceed one-third the pavement depth shall be treated as full depth cracks in accordance with paragraphs 501-4.19b and 501-19c.

b. Slabs with cracks through interior areas. Interior area is defined as that area more than 6 inches (150 mm) from either adjacent original transverse joint. The full slab shall be removed and replaced at no cost to the Owner, when there are any full depth cracks, or cracks greater than one-third the pavement depth, that extend into the interior area.

c. Cracks close to and parallel to joints. All full-depth cracks within 6 inches (150 mm) either side of the joint and essentially parallel to the original joints, shall be treated as follows.

(1) Full depth cracks and original joint not cracked. The full-depth crack shall be treated as the new joint and the original joint filled with an epoxy resin.

i. Full-depth crack. The joint sealant reservoir for the crack shall be formed by sawing to a depth of 3/4 inches (19 mm), ±1/16 inch (2 mm), and to a width of 5/8 inch (16 mm), ±1/8 inch (3 mm). The crack shall be sawed with equipment specially designed to follow random cracks. Any equipment or procedure which causes raveling or spalling along the crack shall be modified or replaced to prevent raveling or spalling. The joint shall be sealed with sealant in accordance with P-605 or as directed by the RPR.

ii. Original joint. If the original joint sealant reservoir has been sawed out, the reservoir and as much of the lower saw cut as possible shall be filled with epoxy resin, Type IV, Grade 2, thoroughly tooled into the void using approved procedures.

If only the original narrow saw cut has been made, it shall be cleaned and pressure injected with epoxy resin, Type IV, Grade 1, using approved procedures.

Where a parallel crack goes part way across paving lane and then intersects and follows the original joint which is cracked only for the remained of the width, it shall be treated as specified above for a parallel crack, and the cracked original joint shall be prepared and sealed as originally designed.

(2) Full depth cracks and original joint cracked. If there is any place in the lane width where a parallel crack and a cracked portion of the original joint overlap, the entire slab containing the crack shall be removed and replaced.

d. Removal and replacement of full slabs. Make a full depth cut perpendicular to the slab surface along all edges of the slab with a concrete saw cutting any dowels or tie-bars. Remove damaged slab protecting adjacent pavement from damage. Damage to adjacent slabs may result in removal of additional slabs as directed by the RPR at the Contractor's expense.

The underlying material shall be repaired, re-compacted and shaped to grade.

Dowels of the size and spacing specified for other joints in similar pavement on the project shall be installed along all four (4) edges of the new slab in accordance with paragraph 501-4.10d.

Placement of concrete shall be as specified for original construction. The joints around the new slab shall be prepared and sealed as specified for original construction.

e. Spalls along joints.

(1) Spalls less than one inch wide and less than the depth of the joint sealant reservoir, shall be filled with joint sealant material.

(2) Spalls larger than one inch and/or deeper than the joint reservoir, but less than ½ the slab depth, and less than 25% of the length of the adjacent joint shall be repaired as follows:

i. Make a vertical saw cut at least one inch (25 mm) outside the spalled area and to a depth of at least 2 inches (50 mm). Saw cuts shall be straight lines forming rectangular areas surrounding the spalled area.

ii. Remove unsound concrete and at least 1/2 inch (12 mm) of visually sound concrete between the saw cut and the joint or crack with a light chipping hammer.

iii. Clean cavity with high-pressure water jets supplemented with compressed air as needed to remove all loose material.

iv. Apply a prime coat of epoxy resin, Type III, Grade I, to the dry, cleaned surface of all sides and bottom of the cavity, except any joint face.

v. Fill the cavity with low slump concrete or mortar or with epoxy resin concrete or mortar.

vi. An insert or other bond-breaking medium shall be used to prevent bond at all joint faces.

vii. A reservoir for the joint sealant shall be sawed to the dimensions required for other joints, or as required to be routed for cracks. The reservoir shall be thoroughly cleaned and sealed with the sealer specified for the joints.

(3) Spalls deeper than 1/2 of the slab depth or spalls longer than 25% of the adjacent joint require replacement of the entire slab.

f. Diamond grinding of Concrete surfaces. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding of the hardened concrete should not be performed until the concrete is at least 14 days old and has achieved full minimum strength. Equipment that causes ravels, aggregate fractures, spalls or disturbance to the joints will not be permitted. The depth of diamond grinding shall not exceed 1/2 inch (13 mm) and all areas in which diamond grinding has been performed will be subject to the final pavement thickness tolerances specified.

Diamond grinding shall be performed with a machine specifically designed for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with sufficient number of flush cut blades that create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The Contractor shall determine the number and type of blades based on the hardness of the aggregate. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.

Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. All grinding shall be at the expense of the Contractor.

CONTRACTOR QUALITY CONTROL (CQC)

501-5.1 Quality control program. The Contractor shall develop a Quality Control Program in accordance with Item C-100. No partial payment will be made for materials that are subject to specific quality control requirements without an approved quality control program.

501-5.2 Contractor Quality Control (CQC). The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the

incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

501-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to this specification and as set forth in the CQCP. The testing program shall include, but not necessarily be limited to, tests for aggregate gradation, aggregate moisture content, slump, and air content. A QC Testing Plan shall be developed and approved by the RPR as part of the CQCP.

The RPR may at any time, notwithstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of concrete mixture which is rendered unfit for use due to contamination, segregation, or improper slump. Such rejection may be based on only visual inspection. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price**.**

a. Fine aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C70 or ASTM C566.

(3) Deleterious substances. Fine aggregate as delivered to the mixer shall be tested for deleterious substances in fine aggregate for concrete as specified in paragraph 501-2.1b, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

b. Coarse Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C566.

(3) Deleterious substances. Coarse aggregate as delivered to the mixer shall be tested for deleterious substances in coarse aggregate for concrete as specified in paragraph 501-2.1c, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

c. Slump. One test shall be made for each sublot. Slump tests shall be performed in accordance with ASTM C143 from material randomly sampled from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

d. Air content. One test shall be made for each sublot. Air content tests shall be performed in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

e. Unit weight and Yield. One test shall be made for each sublot. Unit weight and yield tests shall be in accordance with ASTM C138. The samples shall be taken in accordance with ASTM C172 and at the same time as the air content tests.

f. Temperatures. Temperatures shall be checked at least four times per lot at the job site in accordance with ASTM C1064.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA profile program ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 501-4.19f or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 501-6.6.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade will be evaluated prior to and after placement of the concrete surface.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR by the end of the following working day.

Areas with humps or depression that that exceed grade or smoothness and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. If these areas cannot be corrected with grinding then the slabs that are retaining water must be removed and replaced in accordance with paragraph 501-4.19d. Grinding shall be in accordance with paragraph 501-4.19f. All corrections will be at the Contractors expense.

501-5.4 Control charts. The Contractor shall maintain linear control charts for fine and coarse aggregate gradation, slump, and air content. The Contractor shall also maintain a control chart plotting the coarseness factor/workability factor from the combined gradations in accordance with paragraph 501-2.1d.

Control charts shall be posted in a location satisfactory to the RPR and shall be kept up to date at all times. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and suspension Limits, or Specification limits, applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a potential problem and the Contractor is not taking satisfactory corrective action, the RPR may halt production or acceptance of the material.

a. Fine and coarse aggregate gradation. The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Superimposed on the control charts shall be the action and suspension limits. Gradation tests shall be performed by the Contractor per ASTM C136. The Contractor shall take at least two samples per lot to check the final gradation. Sampling shall be per ASTM D75 from the flowing aggregate stream or conveyor belt.

b. Slump and air content. The Contractor shall maintain linear control charts both for individual measurements and range (that is, difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.

c. Combined gradation. The Contractor shall maintain a control chart plotting the coarseness factor and workability factor on a chart in accordance with paragraph 501-2.1d.

Control Chart Limits[1]

Control Parameter	Individual Measurements	
	Action Limit	**Suspension Limit**
Gradation[2]	*[3]	*[3]
Coarseness Factor (CF)	±3.5	±5
Workability Factor (WF)	±2	±3
Slump	+0.5 to -1 inch (+13 to -25 mm)	+1 to -1.5 inch (+25 to -38 mm)
Air Content	±1.5%	±2.0%

[1] Control charts shall developed and maintained for each control parameter indicated.

[2] Control charts shall be developed and maintained for each sieve size.

[3] Action and suspension limits shall be determined by the Contractor.

501-5.5 Corrective action at Suspension Limit. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of control. The CQCP shall detail what action will be taken to bring the process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

a. Fine and coarse aggregate gradation. When two consecutive averages of five tests are outside of the suspension limits, immediate steps, including a halt to production, shall be taken to correct the grading.

b. Coarseness and Workability factor. When the CF or WF reaches the applicable suspension limits, the Contractor, immediate steps, including a halt to production, shall be taken to correct the CF and WF.

c. Fine and coarse aggregate moisture content. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5%, the scale settings for the aggregate batcher and water batcher shall be adjusted.

d. Slump. The Contractor shall halt production and make appropriate adjustments whenever:

(1) one point falls outside the Suspension Limit line for individual measurements

OR

(2) two points in a row fall outside the Action Limit line for individual measurements.

d. Air content. The Contractor shall halt production and adjust the amount of air-entraining admixture whenever:

(1) one point falls outside the Suspension Limit line for individual measurements

OR

(2) two points in a row fall outside the Action Limit line for individual measurements.

MATERIAL ACCEPTANCE

501-6.1 Quality Assurance (QA) Acceptance sampling and testing. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section, with the exception of coring for thickness determination, will be performed by the RPR. The Contractor shall provide adequate facilities for the initial curing of beams. The Contractor shall bear the cost of providing initial curing facilities and coring and filling operations, per paragraph 501-6.5b(1).

The samples will be transported while in the molds. The curing, except for the initial cure period, will be accomplished using the immersion in saturated lime water method. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60° to 80°F (16° to 27°C), and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather, or in heavyweight closed plastic bags, or using other suitable methods, provided the temperature and moisture loss requirements are met.

501-6.2 Quality Assurance (QA) testing laboratory. Quality assurance testing organizations performing these acceptance tests will be accredited in accordance with ASTM C1077. The quality assurance laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods will be submitted to the RPR prior to start of construction.

501-6.3 Lot size. Concrete will be accepted for strength and thickness on a lot basis. A lot will consist of a day's production not to exceed 4,800 square yards. Each lot will be divided into approximately equal sublots with individual sublots between 400 to 600 cubic yards. Where three sublots are produced, they will constitute a lot. Where one or two sublots are produced, they will be incorporated into the previous or next lot. Where more than one plant is simultaneously producing concrete for the job, the lot sizes will apply separately for each plant.

501-6.4 Partial lots. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot or for overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they will constitute a lot. Where one or two sublots have been produced, they will be incorporated into the next lot or the previous lot and the total number of sublots will be used in the acceptance criteria calculation, that is, n=5 or n=6.

501-6.5 Acceptance Sampling and Testing.

a. Strength.

(1) Sampling. One sample will be taken for each sublot from the concrete delivered to the job site. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. The concrete will be sampled in accordance with ASTM C172.

(2) Test Specimens. The RPR will be responsible for the casting, initial curing, transportation, and curing of specimens in accordance with ASTM C31. Two (2) specimens will be made from each sample and slump, air content, unit weight, and temperature tests will be conducted for each set of strength specimens. Within 24 to 48 hours, the samples will be transported from the field to the laboratory while in the molds. Samples will be cured in saturated lime water.

The strength of each specimen will be determined in accordance with ASTM C78. The strength for each sublot will be computed by averaging the results of the two test specimens representing that sublot.

(3) Acceptance. Acceptance of pavement for strength will be determined by the RPR in accordance with paragraph 501-6.6b(1). All individual strength tests within a lot will be checked for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and the remaining test values will be used to determine acceptance in accordance with paragraph 501-6.5b.

b. Pavement thickness.

(1) Sampling. One core will be taken by the Contractor for each sublot in the presence of the RPR. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. Areas, such as thickened edges, with planned variable thickness, will be excluded from sample locations.

Cores shall be a minimum 4 inch (100 mm) in diameter neatly cut with a core drill. The Contractor will furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes will be filled by the Contractor with a non-shrink grout approved by the RPR within one day after sampling.

(2) Testing. The thickness of the cores will be determined by the RPR by the average caliper measurement in accordance with ASTM C174. Each core shall be photographed and the photograph included with the test report.

(3) Acceptance. Acceptance of pavement for thickness will be determined by the RPR in accordance with paragraph 501-6.6.

501-6.6 Acceptance criteria.

a. General. Acceptance will be based on the following characteristics of the completed pavement discussed in paragraph 501-6.5b:

(1) Strength

(2) Thickness

(3) Grade

(4) Profilograph smoothness

(5) Adjustments for repairs

Acceptance for strength, thickness, and grade, will be based on the criteria contained in accordance with paragraph 501-6.6b(1), 501-6.6b(2), and 501-6.6b(3), respectively. Acceptance for profilograph smoothness will be based on the criteria contained in paragraph 501-6.6b(4).

Production quality must achieve 90 PWL or higher to receive full payment.

Flexural Strength and thickness will be evaluated for acceptance on a lot basis using the method of estimating PWL. Production quality must achieve 90 PWL or higher to receive full pavement. The PWL will be determined in accordance with procedures specified in Item C-110.

The lower specification tolerance limit (L) for strength and thickness will be:

Lower Specification Tolerance Limit (L)

Strength	0.93 × strength specified in paragraph 501-3.3
Thickness	Lot Plan Thickness in inches, - 0.50 in

b. Acceptance criteria.

(1) Strength. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(**2) Thickness.** If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(3) Grade. The final finished surface of the pavement of the completed project will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically **[** or 0.1 feet (30 mm) laterally **]**. The documentation, stamped and signed by a licensed surveyor shall be in accordance with paragraph 501-5.3h. Payment for sublots that do not meet grade for over 25% of the sublot shall reduced by 5% and not be more than 95%.

(4) Profilograph roughness for QA Acceptance. The final profilograph shall be the full length of the project to facilitate testing of roughness between lots. The Contractor, in the presence of the RPR shall perform a profilograph roughness test on the completed project with a profilograph meeting the requirements of ASTM E1274 or a Class I inertial profiler meeting ASTM E950. Data and results shall be provided within 48 hrs of profilograph roughness tests.

The pavement shall have an average profile index less than 15 inches per mile per 1/10 mile. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must grind" bumps and the Profile Index for the pavement using a 0.2-inch (5 mm) blanking band. The bump template must span one inch (25 mm) with an offset of 0.4 inches (10 mm). The profilograph must be calibrated prior to use and operated by a factory or State DOT approved, trained operator. Profilograms shall be recorded on a longitudinal scale of one inch (25 mm) equals 25 feet (7.5 m) and a vertical scale of one inch (25 mm) equals one inch (25 mm). Profilograph shall be performed one foot right and left of project centerline and 15 feet (4.5 m) right and left of project centerline. Any areas that indicate "must grind" shall be corrected with diamond grinding per paragraph 501-4.19f or by removing and replacing full depth of surface course. as directed by the RPR. Where corrections are necessary, a second profilograph run shall be performed to verify that the corrections produced an average profile index of 15 inches per mile per 1/10 mile or less.

(5) Adjustments for repair. Sublots with spall repairs, crack repairs, or partial panel replacement, will be limited to no more than 95% payment.

(6) Adjustment for grinding. For sublots with grinding over 25% of a sublot, payment will be reduced 5%.

METHOD OF MEASUREMENT

501-7.1 Concrete pavement shall be measured by the number of square yards of reinforced pavement as specified in-place, completed and accepted , and shall include preparation of base, steel reinforcement, cement concrete per section P-501, curing, sawcutting, joint sealing, curing and all material and incidentals as specified herein.

BASIS OF PAYMENT

501-8.1 Payment. Payment for concrete pavement meeting all acceptance criteria as specified in paragraph 501-6.6. Acceptance Criteria shall be based on results of strength, smoothness, and thickness tests. Payment for acceptable lots of concrete pavement shall be adjusted in accordance with paragraph 501-8.1a for strength and thickness; 501-8.1b for repairs; 501-8.1c for grinding; and 501-8.1d for smoothness, subject to the limitation that:

The total project payment for concrete pavement shall not exceed 100 percent of the product of the contract unit price and the total number of square yards of concrete pavement used in the accepted work (See Note 1 under the Price Adjustment Schedule table below).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings.

a. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with the Price Adjustment Schedule table below. A pay factor shall be calculated for both strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both strength and thickness are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either strength or thickness is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both strength and thickness are less than 100%.

Price Adjustment Schedule[1]

Percentage of Materials Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 90	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject[2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment in excess of 100% shall be subject to the total project payment limitation specified in paragraph 501-8.1.

[2] The lot shall be removed and replaced unless, after receipt of FAA concurrence, the Owner and Contractor agree in writing that the lot will remain; the lot paid at 50% of the contract unit price; and the total project payment limitation reduced by the amount withheld for that lot.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 501-8.1. Payment in excess of 100% for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100%; except for rejected lots which remain in place and/or sublots with adjustments for repairs.

b. Adjusted payment for repairs. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots which contain repairs in accordance with paragraph 501-4.19 on more than 20% of the slabs within the sublot. Payment factors greater than 100 percent for the strength and thickness cannot be used to offset adjustments for repairs.

c. Adjusted payment for grinding. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots with grinding over 25% of a sublot.

d. Profilograph Roughness. The Contractor will receive full payment when the profilograph average profile index is in accordance with paragraph 501-6.6b(4). When the final average profile index for the entire length of pavement does not exceed 15 inches per mile per 1/10 mile, payment will be made at the contract unit price for the completed pavement.

e. Payment. Payment shall be made under:

Item P-501-8.1	Cement Concrete Pavement, 15-Inch - per square yard
Item P-501-8.1	Cement Concrete Pavement, 16-Inch - per square yard
Item P-501-8.3	Cement Concrete Pavement, 18-Inch - per square yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A996	Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
ASTM A1035	Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM A1078	Standard Specification for Epoxy-Coated Steel Dowels for Concrete Pavement
ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C70	Standard Test Method for Surface Moisture in Fine Aggregate
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C117	Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C123	Standard Test Method for Lightweight Particles in Aggregate
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C174	Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM C227	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregates by Drying
ASTM C595	Standard Specification for Blended Hydraulic Cements

ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C881	Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1064	Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber and Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Concrete Institute (ACI)

ACI 305R	Guide to Hot Weather Concreting
ACI 306R	Guide to Cold Weather Concreting
ACI 309R	Guide for Consolidation of Concrete

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

Federal Highway Administration (FHWA)

HIPERPAV 3, version 3.2

Portland Concrete Association (PCA)

PCA	Design and Control of Concrete Mixtures, 16th Edition

U.S. Army Corps of Engineers (USACE) Concrete Research Division (CRD)

CRD C662	Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials, Lithium Nitrate Admixture and Aggregate (Accelerated Mortar-Bar Method)

United States Air Force Engineering Technical Letter (ETL)

ETL 97-5	Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements

END ITEM P-501

ATTACHMENT 3

PROPOSAL PREPARATION, SUBMISSION AND EVALUATION GUIDELINES

PROPOSAL PREPARATION, SUBMISSION & EVALUATION

I. Explanation to Prospective Offerors

Any prospective offeror desiring an explanation or interpretation of this RFP must request it in writing no later than four business days before the last date for submission of proposals. Requests should be directed to the individual in charge at the address listed in the RFP. Any information given to a prospective offeror concerning a solicitation will be furnished promptly to all other prospective offerors as an amendment to the RFP, if that information is necessary in submitting offers or if the lack of it would be prejudicial to any other prospective offerors.

II. Complete Proposals

Proposals shall represent the best efforts of the offerors and will be evaluated as such. Proposals must set forth full, accurate, and complete information as required by this section and other sections of this RFP.

III. Unnecessarily Elaborate Proposals

Brochures or other presentations beyond those sufficient to present a complete and effective response to this solicitation are not desired and may be construed as unnecessarily elaborate and an indication of the offeror's lack of cost consciousness. Elaborate art work, expensive paper and binding, and expensive visual and other presentation aids are neither necessary nor desired. Concise and clear proposals are sought.

IV. Retention of Proposals

All proposal documents shall be retained by the County and therefore, will not be returned to the offerors. The County will not pay for preparation of proposals or for proposals that are retained by the County.

V. Examination of Proposals

Offerors are expected to examine the Site, Statement of Work and all instructions and attachments in this RFP. Failure to do so will be at the offeror's risk.

VI. Legal Status of Offeror

Each offeror must provide the following information in its proposal:

A. Name of the offeror;

B. Whether offeror is a corporation, joint venture, partnership (including type of partnership), or individual;

C. Copy of any current license, registration, or certification to transact business in the State of Wisconsin if required by law to obtain such license, registration, or certification. If the offeror is a corporation or limited partnership and does not

provide a copy of its license registration, or certification to transact business in the State of Wisconsin, the offeror shall certify its intent to obtain the necessary license, registration or certification prior to contract award or its exemption from such requirements; and

D. Copies of any current license, registration or certification required in RFP;

E. If the offeror is a partnership of joint venture, names of general partners or joint venturers.

VII. Organization of Offeror

Each proposal must further contain a chart showing the internal organization of the offeror and the numbers of regular personnel in each organizational unit.

VIII. Offerors Authorized Agent

Each proposal shall set forth the name, title, telephone number, and address of the person authorized to negotiate in behalf of the offeror and contractually bind the offeror, if other than the person signing the proposal.

IX. Price Schedule Submission

Do not submit prices with this RFP. The selected consultant shall provide a cost, labor hour, and reimbursable breakdown, within three business days of notification of selection. This breakdown shall be in table format shown in AC 150/5100-14E Change 1, Appendix D.

X. Certification and Representations

Offerors shall return with their proposal resumes and any other documents as may be requested in the RFP.

XIII. Acknowledgement of Amendments

Offerors shall acknowledge receipt of any amendment to this solicitation within their proposal.

XIV. Late Proposals and Modifications and Withdrawals of Proposals

Any proposal received at the office designated in the solicitation after the exact time specified for receipt will not be considered.

XV. Proposal Evaluation Criteria

Following a list of general criteria which will be used to evaluate the proposals:

a. Quality and responsiveness to the RFP. Weight: 20%

b. Project approach and understanding, including strategy to perform requested work and time schedule. Weight: 40%.

c. Qualifications and experience of proposed project manager and team. Weight: 40%.

XVI. Staffing

Consultant shall provide, at its own expense, all personnel required in performing the services under this agreement. Such personnel shall not be employees of Owner.

The offeror must describe his or her qualifications and experience to perform the work described in this RFP. Information about experience should include direct experience with the specific matter and similar facilities. Areas of expertise of each proposed staff member shall be provided (i.e., engineering, economics, architecture, planning). Specific examples of similar or related projects previously conducted shall cite:

- Name of client organization
- Name, address, and current telephone number of client contact person
- Contract number and inclusive dates
- Contract amount

Offeror shall provide the following information for every resume:

- Full name
- Title and areas of specialty
- Affiliation (that is, staff of offeror or subconsultant)
- Experience directly related to the proposed project
- Education/training
- Individual personnel hours and percentage of total project time which will be devoted to the proposed project in total and broken down by task. (See suggested matrix below)
- Resumes shall be included for all personnel expected to work on the project. Only resumes of staff or subconsultant staff employed by or under contract with the firm as of the date of proposal submission are to be included.

ATTACHMENT 4

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
CONSULTANT TEAM MEMBER DBE STATUS FORM

Runway 7R-25L Pavement Rehabilitation

CONSULTANT TEAM MEMBERS

		CERTIFICATION STATUS	
Firm's Name	Address	DBE	NONE

#Check applicable certification status boxes. Submit this form with proposal.

ATTACHMENT 5

DISADVANTAGED BUSINESS ENTERPRISE (DBE) REFERENCE FORMS

(Note: We are providing these forms for reference only. **Do not submit them with your proposal.** The selected consultant is required to complete these forms later, as part of the scope and fee negotiation phase.)

COMMUNITY BUSINESS DEVELOPMENT PARTNERS

MILWAUKEE COUNTY

COMMITMENT TO CONTRACT WITH *DBE*

PROJECT No. _____ PROJECT TITLE _____

TOTAL CONTRACT AMOUNT (less allowances) $ _____ DBE Goal: _____

Name & Address of DBE(*)	Scope of Work Detailed Description	1) DBE Contract Amount	2) % of Total Contract

1) **The total project contract amount is an estimate based on the outcome of negotiation between the Prime and Milwaukee County. In some situations the DBE sub-contract amount might NOT be based on the total project contract amount.**

2) **The percentage is based on the eligible scope of services that DBE participation can reasonably be obtained; which might not be based on the total project contract amount. The commitment percentage is the key indicator of DBE participation. The Pass/Fail determination is based on the percentage stated in the RFP/BID. If the Prime is using one or multiple DBE companies the sum of the percentages MUST satisfy the minimum percentage stated in the RFP/BID. Note the percentage indicated on this document will be viewed by CBDP the Prime's COMMITMENT to the TBE company.**

Bidder/Proposer Commitment (To be completed by firm committing work to DBE)

I certify that the DBE firm quoted the identified service(s) and cost(s). I further acknowledge our firm having negotiated with, and having received confirmation, on partnering, pricing and delivery from DBE firm listed herein.
Prime Contractor/Consultant_____Phone No._____, or one of our subs, will enter into contract with the DBE firm listed, for the service(s) and amount(s) specified when awarded this contract. The information on this form is true and accurate to the best of my knowledge. I further understand that falsification, fraudulent statement, or misrepresentation will result in appropriate sanctions under applicable law.

Signature of Authorized Representative | Name & Title of Authorized Representative | Date

DBE Affirmation (To be completed by DBE Owner/Authorized Representative)

- I affirm that the Wisconsin UCP has certified our company as a DBE, and that our company is currently listed in the Wisconsin UCP Directory.
- I acknowledge and accept this commitment to contract with my firm for the service(s) and dollar amount(s) specified herein, as put forth by (Prime or sub)_____.
- I understand and accept that this commitment is for service(s) to be rendered in completion of the project specified herein to be completed with my own forces.
- I affirm that approval from CBDP will be obtained prior to subletting any portion of this work awarded to my firm on this project.

Signature of Authorized DBE Representative | Name & Title of Authorized DBE Representative | Phone Number | Date

FOR CBDP USE ONLY

Commitment number ___ **of** ___ **Participation:** _____ Project Total _____

Signature _____ Date _____ Authorized Signature _____ Date_____

COMMUNITY BUSINESS DEVELOPMENT PARTNERS

MILWAUKEE COUNTY

COMMITMENT TO CONTRACT WITH *DBE*

ADDITIONAL INFORMATION & REQUIREMENTS:

1. The Directory of Certified DBE firms eligible for credit toward the satisfaction of this project's DBE goal will be found at the following link, and can be searched by Name and/or NAICS code.

http://wisconsindot.gov/Pages/doing-bus/civil-rights/dbe/certified-firms.aspx

2. **CONTRACT ADJUSTMENTS**: The successful Bidder/Proposer will maintain the approved DBE participation level during the term of the contract with the County, including any additional work on the contract, e.g., change orders, addendums, scope changes, or fee increases.

3. **WRITTEN CONTRACTS WITH DBEs**: The County requires that the successful Bidder/Proposer enter into contract, directly or through subs, as stated in this form. Agreements must be submitted to the County within 7 days of receipt of the Notice-To-Proceed. By executing this commitment, you are certifying that you have had contact with the named DBE firm and that they will be hired if you are awarded the contract by the County.

4. **SUBSTITUTIONS, DBE SUBCONTRACTING WORK, TRUCKING FIRMS**: The successful Bidder/Proposer must submit written notification of desire for substitution to the DBE affected, and send a copy to the County, stating the reason(s) for the request. The DBE will have five (5) business days to provide written objection/acceptance of the substitution. The "right to correct" must be afforded any DBE objecting to substitution/termination for less than good cause as determined by the County. Approval must be obtained from the County prior to making any substitutions. DBEs are also required to notify and obtain approval from the County prior to seeking to subcontract out work on this project. In the case of DBE trucking firms, credit will be given for trucks leased from other DBE firms; however, if the DBE leases trucks from non-DBE firms, the commission or fee will be counted for DBE crediting.

5. **REQUESTS FOR PAYMENT**: The successful Bidder/Proposer must indicate on the Continuation Sheet (AIA form G703, or equivalent) the work being performed by DBE by either a) placing the word "DBE" behind the work item or b) breaking out the work done by DBEs at the end of the report. The successful Bidder/Proposer shall notify DBE firms of the date on which they must submit their invoices for payment.

6. **DBE UTILIZATION REPORTS**: The successful Bidder/Proposer will enter payments to subs and suppliers directly into the County's online reporting system on a monthly basis. These entries will cover payments made during the preceding month and will include zero dollar ($0) entries where no payment has occurred.

If you have any questions related to Milwaukee County's DBE Program, please contact:

414.278.4851 **or** cbdpcompliance@milwaukeecountywi.gov

ATTACHMENT 6

SAMPLE CONSULTING CONTRACT

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES
FACILITIES MANAGEMENT DIVISION
CONSULTANT AGREEMENT
FOR
PROFESSIONAL SERVICES

Compensation Based on
"Not-To-Exceed" Sum and
Individual "Direct Salary Rates/Hour"
(Without Outside Construction Manager)

TYPE "C" AGREEMENT

PROJECT TITLE: _____

PROJECT LOCATION: _____

PROJECT NO.: _____

Agency _____ Org. No. _____ Object No. _____

Project Code _____ Activity _____ Function _____

Category _____

Consultant Firm: _____

Address: _____

_____

(City) (State) (Zip Code)

Phone No. _____ Fax No. _____

Email: _____

Type of Services: _____

TABLE OF CONTENTS

ATTACHMENTS

THIS AGREEMENT, entered into this _____ day of _____ 20_____, by and between MILWAUKEE COUNTY (hereinafter referred to as "MILWAUKEE COUNTY" or "OWNER") and

_____

(hereinafter referred to "CONSULTANT"), is subject to the following conditions:

1. GENERAL CONSULTANT

1.1 The Consultant shall provide Professional Architectural and/or Engineering Services for the various phases of the Project, as may be authorized, in accordance with the terms and conditions of this Agreement.

1.2 The CONSULTANT shall designate in the space provided below one principal of the firm responsible to OWNER and available to answer questions, make decisions, and bear full responsibility for the Project.

_____ is the designated principal.

2. PROJECT SCOPE

2.1 Work within the scope of this Agreement shall include the tasks and objectives set forth in the OWNERS Request for Proposal ("RFP"), which is incorporated herein by reference, the CONSULTANTS Scope of Work (see **Attachment "A"**), and any Addenda, on a Not-to-Exceed Sum Basis with Reimbursable Expense if required as outlines in this Agreement.

2.1.1 CONSULTANT shall preform professional consulting services for OWNER when and as directed by OWNER and shall respond to OWNER inquiries within forty-eight (48) hours.

2.1.2 OWNERS desired completion dates for critical items: (refer to Paragraph 3.8 Performance Time)

.1 Programming and Master Plan _____

.2 Schematic Design _____

.3 Design Development _____

.4 Contract Documents _____

.5 Bid Opening _____

.6 Construction Start _____

.7 Substantial Completion/Occupancy _____

.8 _____

.9 _____

.10 _____

3. BASIC SERVICES

Services shall be furnished by the CONSULTANT for performance of the following as may be requested in the RFP and the Scope of Work. Basic Services shall include all work described herein except as more specifically described, required, added or modified by the RFP, Scope of Work and Addenda.

3.1 Programming and/or Master Plan Phase

3.1.1 From Interviews, research, and study of the OWNERS needs, the CONSULTANT shall prepare a program and an Estimate of Probable Construction Costs for the project. Elements of the program shall include a full description of each of the following:

.1 Exterior and interior functional areas and spaces of the Project, with technical and equipment requirements on each;

.2 Comparisons between existing and proposed facilities and systems;

.3 Diagrams to describe proposed circulation and relationships between functional areas and departments;

.4 Descriptions of provisions for future changes and growth;

.5 Narrative of the rationale for proposed program and prioritized options to maintain Project budget.

3.1.2 Upon completion of the Programming Phase documents, the CONSULTANT shall submit three (3) copies of drafts of same for review.

3.1.3 After review, the CONSULTANT shall incorporate necessary corrections and additions into the final report and submit three (3) copies to OWNER for approval.

3.2 Schematic Design Phase

3.2.1 Based upon the approved written program and budget, the CONSULTANT shall further examine the site and existing facilities, study existing conditions, and, based on the programmed analysis of OWNER's requirements, prepare studies and drawings of suggested solutions, outline suggested construction materials and systems, and submit recommendations for approval by OWNER.

3.2.2 The CONSULTANT shall prepare drawings and other exhibits which are conceptual in character and closely follow the program developed and accepted in the Programming Phase.

3.2.3 The CONSULTANT shall incorporate in these schemes conceptual building plans, preliminary sections and elevations, influence of site, selection of building systems and materials, and show approximate dimensions, areas and volumes.

3.2.4 The CONSULTANT shall submit an Estimate of Probable Construction Costs upon which OWNER can evaluate the Project and determine whether to proceed with the Design Development Phase.

3.2.5 The CONSULTANT shall submit three (3) copies of the Schematic Design Phase documents for review.

3.3 Design Development Phase

3.3.1 After receiving approval of the Schematic Design Phase submittal, the CONSULTANT shall develop design and prepare drawings and other documents to fix and describe the size and character of the entire Project as to site work, architectural, structural, mechanical, and electrical systems, equipment, construction materials, and such other essentials as may be appropriate, including functional and operational aspects of facilities.

3.3.2 The CONSULTANT shall design the Project in compliance with applicable federal, state, and local codes, ordinances and regulations, and with requirements or service rules of utilities having jurisdiction.

3.3.3 The CONSULTANT shall provide revised Estimate of Probable Construction Costs provided during Schematic Design Phase.

3.3.4 The CONSULTANT shall submit three (3) copies of the Design Development Phase documents for review.

3.4 Contract Documents Phase

3.4.1 After receiving approval of Design Development Phase submittal, the CONSULTANT shall prepare drawings and specifications for bidding and construction purposes, including what testing, warranties and guarantees are required of the parts and systems. When documents are approximately eighty percent (80%) complete, the CONSULTANT shall submit three (3) copies to OWNER for review and comments.

3.4.2 When the documents are one hundred percent (100%) complete, the CONSULTANT shall submit three (3) copies to OWNER for approval of completed Bidding Documents and an updated Estimate of Probable Construction Costs.

3.4.3 The CONSULTANT shall conform to OWNER's current standard formats on file in Architecture, Engineering and Environmental Services Section of the Facilities Management Division of Milwaukee County Department of Administrative Services, 633 W. Wisconsin Avenue, 10th Floor, Milwaukee, Wisconsin 53203.

3.4.4 After the one hundred percent (100%) complete bidding documents have been approved by OWNER, the CONSULTANT shall submit one (1) signed, stamped original set of Bidding Documents suitable for use in reproducing document sets for distribution during the bid process, unless otherwise specified in the Agreement.

3.5 Bidding Phase

3.5.1 OWNER will make Contract Documents available to Bidders. OWNER will determine cost and other terms. OWNER will direct bidding of Contracts (informal, formal, multiple or single prime construction contracts).

3.5.2 CONSULTANT shall:

.1 Coordinate with OWNER for Advertisement of Bids. OWNER will prepare and place Advertisement of Bids.

.2 Make Application for required plan approvals. Pay local and state Examination Fees and be reimbursed at cost (fee for General Building Permit to be paid by Contractor).

.3 Prepare necessary Addenda copies for distribution required to amend or clarify Bidding

Documents. Complete Addenda so Bidders have access to them at leave five (5) working days prior to bid opening. OWNER will mail out Addenda copies if they are delivered no later than seven (7) working days prior to bid opening.

.4 Conduct a pre-bid conference, log attendance, tour site and take minutes of the conference, with one (1) copy to OWNER.

.5 Review bids for conformance with bidding requirements. Make recommendations as to award of contract(s).

3.5.3 If the low acceptable bid total received exceeds by five percent (5%) the Estimate of Probable Construction Costs submitted prior to bidding, the CONSULTANT shall revise the Bidding Documents, and rebid the project at no additional cost to OWNER.

3.6 Construction Phase

3.6.1 The CONSULTANT shall provide clarifications necessary for construction; review and approve shop drawings and other submittals; coordinate colors and materials with OWNER as defined in the Contract Documents.

3.6.2 The CONSULTANT shall provide administration; coordination and on-site observation of the work in compliance with Wis. Stats. Chapter 443; confirm compliance with Contract Documents; determine quality and acceptability of materials provided and interpret Contract Documents; observe required tests; make recommendations regarding Change Orders and payments to contractors; and make recommendations as to Substantial Completion and final acceptance of the Project.

3.6.3 The CONSULTANT shall issue a Construction Bulletin ("CB") in response to all Requests for Information ("RFIs") estimated to impact the construction contract dollar amount by more than $5,000.00. A CB may be required on a case-by-case basis by the OWNER for RFIs estimated to impact the construction contract dollar amount by less than $5,000.00.

3.6.4 The number of additional CONSULTANT visits to site shall be as stated in the RFP.

3.6.5 The CONSULTANT shall not have authority over or responsibility for means, methods, techniques, sequences or procedures of construction selected by contractor(s) for safety precautions and programs incident to the work of contractor(s) or for the failure of contractor(s) to comply with laws, rules or regulations, ordinances, codes, or orders applicable to contractor(s) furnishing and performing work.

3.7 General Consultant Services

CONSULTANT services applicable to the above phases include the following:

3.7.1 Conferences with OWNER, Users, Prime Contractors and subcontractors required to review and resolve questions regarding the Project.

3.7.2 When requested by OWNER, the CONSULTANT shall attend presentations and appearances before public bodies with OWNER to discuss details, to comment, to recommend, to give progress reports, and to obtain approvals.

3.7.3 **Cost Control:** The budget established by the OWNER for the construction of the Project and CONSULTANT fee shall be considered as absolute. The CONSULTANT shall advise OWNER in writing of the following:

.1 If directives or actions of OWNER increase the scope or cost of the Project or are considered by CONSULTANT to constitute Additional Services under this Agreement.

.2 If CONSULTANT becomes aware that current market conditions have changed sufficiently to preclude construction within the limits of the approved budget.

3.7.4 The CONSULTANT shall recommend to OWNER the obtaining of such investigations, surveys, tests, analyses, and reports as may be necessary for proper execution of CONSULTANT's services.

3.7.5 CONSULTANT shall comply with Wisconsin Laws pertaining to registered architects and engineers, and federal, state, and local laws, codes, and regulations relating to responsibilities in design and administration of this Agreement.

3.8 Performance Time

The CONSULTANT shall complete the following time schedule for the performance of CONSULTANTS services:

.1 Programming and/or Master Plan Phase _____

.2 Schematic Design Phase _____

.3 Design Development Phase _____

.4 Contract Document Phase _____

The schedule shall show each phase of the Project in working days, including review times, and, if required, sub-schedules to define critical portions of schedule. The schedule shall be mutually acceptable to CONSULTANT and OWNER and, at a minimum, shall be consistent with the completion dates included in Paragraph 2.1.2.

3.9 Record Documents

See **Attachment "H"**.

3.10 Subconsultant Services

Should CONSULTANT find it necessary or advisable to employ subconsultants for performing services under this Agreement, the following shall apply:

3.10.1 CONSULTANT shall:

.1 Be responsible for services performed by any subconsultants under this Agreement.

.2 Be compensated for the cost of any subconsultants as provided under Payments (subconsultant compensation is included in the overall basic compensation total).

3.10.2 Subconsultants employed shall be engaged in conformance with the following:

.1 Obtain OWNER's written approval for the hiring of each proposed subconsultant to be used in performance of the contractual obligations under this Agreement. Milwaukee County's Project Manager will indicate such approval and/or rejection on **Attachment "I".**

.2 Within five (5) days of the above approval, subconsultant shall execute **Attachment "J"**, binding subconsultant to the terms and conditions of this Agreement including the Audit and

Inspection of Records requirements.

.3 Milwaukee County will not approve as a subconsultant a person connected with a firm manufacturing, selling, or installing material or equipment that is or may be included in Project.

.4 Approved subconsultants shall also complete **Attachment "B"** (Manpower, Direct Salary Rate and Overhead & Profit Factor Schedule) for potential additional services to be requested at a later date.

3.10.3 Unless otherwise approved by OWNER, CONSULTANT shall not employ subconsultants within the CONSULTANT's specialties, i.e. architectural design for architects, electrical for electrical engineers, HVAC for HVAC engineers, etc.

3.10.4 Fees for subconsultants shall be compensated by OWNER as billed to CONSULTANT (there shall be no mark up for costs/fees billed by subconsultants).

3.11 Additional Services

Based on hourly service rates (see **Attachment "B"**).

Services described in this Section are not included in Basic Services, and shall be paid by OWNER in addition to compensation for Basic Services. The services described under this Section shall only be provided if authorized in writing by the OWNER following a mutual agreement of the scope of the additional services and negotiation of a fair and reasonable actual cost "not-to exceed" fee.

3.11.1 If OWNER and CONSULTANT agree that the performance of this Agreement requires representation at the construction site in addition to that described in Paragraph 3.6.2, then CONSULTANT shall provide one or more Project Representatives to assist in carrying out of such additional on-site responsibilities.

.1 Through the observations by such Project Representatives, the CONSULTANT shall endeavor to provide further protection for OWNER against defects and deficiencies in work, but furnishing such project representation shall not modify rights, responsibilities or obligations of CONSULTANT as described elsewhere in this Agreement.

3.11.2 Making revisions in Drawings, Specifications or other documents when such revisions are:

.1 The result of a change by OWNER from a previous instruction or approval given by the OWNER, including revisions made necessary by adjustments in OWNER's program or Project budget;

.2 Required by enactment or revision of codes, laws or regulations subsequent to preparation of such documents; or

.3 Due to changes required as a result of OWNER's failure to render decisions in a timely manner.

3.11.3 Providing services required because of significant changes in the Project including, but not limited to, size, quality, complexity, OWNER's schedule or method of bidding and contracting for construction.

3.11.4 Providing consultation concerning replacement of work damaged by fire or other cause during construction, and furnishing services required in connection with the replacement of such work.

3.11.5 Providing services made necessary by the default of a contractor, by major defects or deficiencies in the work of a contractor, or by the failure of performance of either the OWNER or a contractor under contract for construction.

3.11.6 Providing services in connection with a public hearing, arbitration proceeding or legal proceeding except where CONSULTANT is party thereto or as exempted by Paragraph 4.3.1.

3.11.7 Providing services to apply for and obtain code variances, if necessary.

3.11.8 Provide an inventory and placement of OWNER's existing furniture and equipment.

3.11.9 Providing other services as requested by the OWNER.

3.12 Reimbursable Expenses

See **Attachment "C"** for specific description of reimbursable expenses. Reimbursable expenses are limited to those not included in the CONSULTANTs and/or subconsultants' "Overhead Factor".

3.12.1 The allowance for all reimbursables for the project shall not exceed _____

_____ Dollars. ($ _____).

4. COMPENSATION (applicable to both CONSULTANT and subconsultants)

CONSULTANT compensation for services shall be based on the following terms and conditions:

4.1.1 The Basic Services Compensation Total for the project for the CONSULTANT including all subconsultants shall be the "Not-To-Exceed" sum of _____ Dollars on the basis of hourly rates set forth in Paragraph 4.2.

4.2 Additional Services Rate Itemization

The form on which the Additional Services Rate Itemization is reported and approved is included as **Attachment "B"** (by CONSULTANT and subconsultants).

On **Attachment "B"** list staff by name, including clerical staff, who will be assigned to the Project.

"Overhead Rate" (Overhead Factor less profit) contained within the Overhead Factor submitted by CONSULTANT and each subconsultant shall be Federal Acquisition Regulation ("FAR") (48 CFR 1-31) audit certified. Provide a copy of the most recent auditor's report for each rate.

If CONSULTANT or subconsultant does not possess a FAR audit certified rate then each shall submit as **Attachment "B-2"** their proposed rate, for the fiscal year, with identification of the accounting method used and certification that the proposed rate contains only those indirect costs proper and appropriate for the type of professional services sought by this Agreement. It is understood and agreed that no direct charge will be made for labor or expenses included in the Overhead Factor.

"Overhead Factor" and the "Principal's Flat Rate" shall include but are not limited to reimbursement of the following:

- Social Security
- Vacation, Holiday & Sick Pay
- Pension & Personal Insurance Plans
- Local Telephone & Fax Service
- General Office Expenses
- Dues & Subscriptions
- Profit
- Registration Fees

- Insurance
- Postage & Shipping (see “C-2”)
- Taxes
- Office & Drafting Supplies
- Repairs & Maintenance
- Selling Expense
- Office Rental
- General Advertising
- Office Utilities
- Legal & Accounting Expenses
- Auto Expenses, Parking
- Travel Costs to locations within a 100 mile radius of Milwaukee
- Meals
- Use of Gadd Equipment and Systems (including drawing plots)
- Miscellaneous Overhead

For personnel changes during the term of this Agreement submit a new **Attachment "B-1"** within sixty (60) days of adding or deleting staff used or permanent classification changes. In case of added personnel or classification changes, the new "Direct Salary Rate/Hour" will not increase more than 10 percent (10%) above the rate previously listed for the specific classification being replaced.

4.3 Payment for Approved Additional Services

If approved Additional Services as set forth in Paragraph 3.11 are performed, CONSULTANT shall be paid for such services and expenses on the basis of hourly rates set forth in Paragraph 4.2. Amounts paid may be in excess of the Basic Compensation.

4.3.1 Non-Reimbursable Costs and Services

If arbitration or court proceedings are brought against OWNER for damages or other relief attributable to the negligent acts of CONSULTANT or defective drawings, specifications, or other Contract Documents for which the CONSULTANT is responsible, CONSULTANT, to the extent CONSULTANT is found responsible, shall assume the defense, bear any related legal expense, and satisfy awards and judgments resulting from such claims. The CONSULTANT shall pay the costs of revisions to drawings or other documents because of errors or omissions on the part of CONSULTANT.

Costs not specifically mentioned in **Attachment "C".**

5. PAYMENTS

Payments to CONSULTANT for services shall be made as follows:

5.1 Monthly invoices**: Attachments "D-1" & "D-2"** for "Basic Services Compensation" and **Attachments "D-1", "D-2" and "D-3"** for approved "Additional Services". All costs submitted on these attachments shall be supported by properly executed payrolls, time records, invoices, contracts or vouchers, or other official documentation evidencing in proper detail the nature and propriety of other accounting documents pertaining in whole or in part to the Agreement. Except for documentation specifically required by the attachments, all other supporting documentation shall not be submitted but shall be clearly identified and readily accessible as specified herein under Section 9, AUDIT AND INSPECTION OF RECORDS.

5.1.1 Bill each individual annual project or requested service separately following the format of OWNER's **Attachments "D-1" though "D-3"** not more than once monthly or when project CONSULTANT service is complete. Each billing shall be for not less than $500, except for the final billing for an amount due.

5.2 Monthly Invoices and Retainage

OWNER will make payments to CONSULTANT within thirty (30) days of invoice approval on the basis of monthly billings prepared by the CONSULTANT and approved by the OWNER. Payments will be made on the basis of ninety five percent (95%) of the approved statement. No retainage, however, shall be withheld for reimbursable expenses.

5.3 Progress Payment limitations

Progress payments for basic services shall total no more than the following percentages of total basic compensation payable.

Program and Master Plan ……..... Ten Percent (10%)
Schematic Design ……..... Twenty Five Percent (25%)
Design Development ..... Forty Percent (40%)
Contract Documents ..... Seventy Eight Percent (78%)
Bidding ..... Eighty Two Percent (82%)
Construction Administration ..... One Hundred Percent (100%)

5.4 Final Payment

5.4.1 Final Payment shall be made after the following have been accomplished:

.1 OWNER is in receipt of CONSULTANT's signed Certification of Substantial Completion (A.I.A. Document G704) in conformance with Contract Documents (for each contract).

.2 OWNER is in receipt of "Record Documents".

.3 OWNER is in receipt of CONSULTANT's invoice labeled "Final Billing".

.4 OWNER has determined that CONSULTANT has performed the obligations under this Agreement.

5.4.2 Final payment shall be the release of the five percent (5%) retainage, held by OWNER from partial payments for performance under this Agreement.

5.4.3 Upon notification from OWNER to the CONSULTANT that the obligations under this Agreement have been completed, the CONSULTANT shall within thirty (30) calendar days submit for payment a final invoice for any remaining unpaid charges. Should the CONSULTANT fail to respond within the thirty (30) days, the OWNER will assume no additional charges have been incurred. OWNER will transmit to CONSULTANT notice of termination of this Agreement with a check for any remaining retainage.

6. DISPUTE RESOLUTION

6.1 Claims, disputes and other matters in question between the CONSULTANT and the OWNER arising out of or relating to the Agreement or breach thereof, which cannot be resolved through negotiation between the parties, shall be subject to and decided at the sole discretion of the OWNER, either by the process and procedures set forth in Article 6 of AIA Document 8901, Part 1, (1996 edition, not bound herein) Dispute Resolution - Mediation and Arbitration or in a court of law.

6.2 Any mediation or arbitration conducted under this Agreement shall take place in Milwaukee, Wisconsin, unless an alternative location is chosen by mutual agreement of the Parties. The exclusive venue for any cause of action brought in relation to this Agreement shall be Milwaukee

County Circuit Court, Milwaukee, Wisconsin.

7. CONSULTANTS RESPONSIBILITY

7.1 Insurance & Proof of Financial Responsibility for Claims

Purchase and maintain policies of insurance and proof of financial responsibility to cover costs as may arise from claims of tort as respect damage to persons or property and third parties in such coverage and amounts as required and approved by the County Risk Manager. Furnish acceptable proof of such coverage to the County Risk Manager prior to services commenced under this Agreement.

7.1.2 Provide evidence of the following coverage and minimum amounts.

Type of Coverage	**Minimum Limits**
Wisconsin Workers Compensation	Statutory (Waiver of Subrogation for Worker Comp by Endorsement)
Employers Liability & Disease USL&H and All States Endorsement	$100,000/$500,000/$100,000
General Liability	$5,000,000 Per Occurrence (name the OWNER as additional insured in the general liability policy by endorsement)
Bodily Injury & Property Damage to include personal injury, fire, legal, products and complete operations Contractual Liability and X, C & U	$5,000,000 Aggregate
Architects & Engineers Professional Liability & Errors & Omissions	$2,000,000 Per Occurrence
(Refer to paragraph 7.2 for additional conditions)	
Environmental Impairment Insurance	$1,000,000 Aggregate minimum (Unless not required)
Automobile Liability	(Name the OWNER as an Additional Insured in the automobile policy by endorsement)
Bodily Injury & Property Damage All Autos	$1,000,000 Per Accident

Note: Consultants performing work on the secured air side at General Mitchell International Airport and Timmerman airport shall maintain at least $5,000,000 Auto & Commercial General Liability Limits. This can be satisfied through a combination of Auto and Umbrella, and General Liability and Umbrella Limits.

7.1.3 Except for Environmental Impairment Insurance, Professional Liability (Errors and Omissions), Workers Compensation and Employers Liability, name OWNER as an additional insured in the general liability and automobile policy as their interests may appear as respects services provided in this Agreement. A Waiver of Subrogation for Workers Compensation by endorsement in favor of Milwaukee County shall be provided. Afford OWNER Thirty (30) day written notice of cancellation or non-renewal.

7.1.4 Place insurance specified above with at least an "A" rated carrier per Best's Rating Guide approved to do business in the State of Wisconsin. Submit deviations or waiver of required coverage or minimums in writing to OWNER's Risk Manager for approval as a condition of this Agreement. Waivers may be granted when surplus lines and specialty carriers are used.

7.1.5 Submit certificate of insurance and endorsements for review to OWNER for each successive period of coverage for duration of this Agreement.

7.1.6 The insurance requirements contained within this Agreement are subject to periodic review and adjustment by the OWNER's Risk Manager.

7.1.7 Required certificates and endorsements shall be part of **Attachment "E".**

7.2 Professional Liability - Additional Provisions

7.2.1 Provide additional information on professional liability coverage as respects policy type, i.e., errors and omissions for consultants, architects, and/or engineers, etc.; applicable retention levels; coverage form, i.e. claims-made, occurrence; discovery clause conditions; and effective, retroactive, and expiration dates, to OWNER's Risk Manager as requested to obtain approval of coverage as respects this section.

7.2.2 Be responsible for the accuracy of the services performed under this Agreement and promptly make necessary revisions or corrections to services resulting from negligent acts, errors or omissions without additional compensation.

7.2.3 Give immediate attention to these revisions or corrections to prevent or minimize delay to Project schedule.

7.2.4 Be responsible to the OWNER for losses or costs to repair or remedy as a result of CONSULTANT's negligent acts, errors or omissions.

7.2.5 It is understood and agreed that coverage which applies to services inherent in this Agreement will be extended for two (2) years after completion of work contemplated in this Project if coverage is written on a claims-made basis.

7.2.6 Deviations and waivers may be requested in writing based on market conditions to OWNER's Risk Manager. Approval shall be given in writing of any acceptable deviation or waiver to the CONSULTANT prior to the CONSULTANT effecting any change in conditions as contained in this section. Waivers shall not be unduly withheld nor denied without consultation with the CONSULTANT.

7.2.7 Obtain information on the professional liability coverage of subconsultants and/or subcontractors in the same form as specified above for review by OWNER's Risk Manager.

7.3 Compliance with Governmental Requirements

7.3.1 Evidence satisfactory compliance for Unemployment Compensation and Social Security Reporting as required by federal and state laws.

7.4 Indemnity

Each party agrees to the fullest extent permitted by law to indemnify, defend and hold harmless, the other party, and its agents, officers and employees, from and against all loss and expenses including costs and attorney's fees by reason of liability for damages including suits at law or in equity, caused by any wrongful, intentional, or negligent act or omission of its employees or

agents which may arise out of or are connected with the activities covered by this Agreement. Each party shall further indemnify the other from, and defend against, any liability or expenses (including reasonable attorneys' fees) arising out of or relating to an act or omission by it or its employees arising out of or relating to (1) federal, state, or other laws or regulations for the protection of persons who are members of a protected class or category of persons, (2) sexual discrimination or harassment, (3) any personal injury (including death) received or sustained by any employee of either party, its subcontractors, agents, or invitees for any reason not covered by workers compensation, and (4) any personal injury (including death) sustained by a third party or property damage by reason of any act or omission, negligent, or otherwise, to the extend caused by a party or its employees. Milwaukee County's liability shall be limited by Wisconsin State Statutes § 345.05(3) for automobile and § 893.80(3) for general liability.

7.5 Conflict of Interest

7.5.1 CONSULTANT shall not specify, recommend, nor commit OWNER to purchase or install material or equipment from an entity with which CONSULTANT has financial or ownership interest without obtaining prior approval.

7.6 Cost and Scheduling

See **Attachment "G"** - Cost & Scheduling Systems Requirements.

The CONSULTANT shall prepare for inclusion with **Attachment "A"** a "Scope of Work and Budget" spreadsheet that is intended to represent the CONSULTANT's work plan, estimates of cost by task, and the consequent development of the "Not-To-Exceed" compensation totals for each service provided. The Spreadsheet shall identify all scheduled project tasks, assigned staff and firm, estimated labor hours for each staff by task, the cost per hour for each, reimbursable expenses, and total cost for each staff by task. Reimbursable expenses shall be totaled to correspond with each allowance indicated in Section 3. Additional columns on the spreadsheet shall provide a breakdown of project cost by CONSULTANT and subconsultant.

If specifically requested by OWNER, the spreadsheet shall also contain the direct salary rate per hour, overhead rate and profit for each staff and columns shall be totaled to identify the direct labor, overhead, and profit breakdown of each Basic Services Compensation Total indicated in Section 4 of this Agreement.

Concurrent with each monthly invoice the CONSULTANT shall submit an "Earned Value" spreadsheet in the same format as described above. This spreadsheet shall identify project cost and value earned through the date of each invoice. A pay application will not be accepted for payment processing without an appropriate and accurate identification of earned value on this spreadsheet. Each "Earned Value" spreadsheet shall correspond and agree with the project schedule updates required in **Attachment "G"**.

8. OWNERS RESPONSIBILITIES

8.1 OWNER will provide information regarding the requirements for the Project which will set forth OWNER's objectives, schedule, constraints and criteria.

8.2 OWNER will designate a representative authorized to act on the OWNER's behalf with respect to the Project. The OWNER or such authorized representative shall render, in a timely manner, decisions pertaining to documents submitted by the CONSULTANT.

8.3 OWNER will furnish surveys required by the Project, and not otherwise provided in the CONSULTANTS proposal, describing physical characteristics, legal limitations and utility locations for the site of the Project and a written legal description of the site. Surveys and legal information will include, as applicable, grades and lines of streets, alleys, pavements and

adjoining property and structures; adjacent drainage; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and necessary data pertaining to existing buildings, other improvements and trees; utility services and lines, both public and private, above and below grade, including inverts and depths. Survey information will be referenced to the project benchmark.

8.4 OWNER will furnish the services of geotechnical engineers when such services are requested by the CONSULTANT.

8.5 OWNER will furnish structural, mechanical, and other laboratory and environmental tests, required by law or the Contract Documents.

8.6 OWNER will give prompt written notice to CONSULTANT if OWNER becomes aware of a fault or defect in the Project or CONSULTANT's nonconformance with the Contract Documents.

8.7 OWNER will utilize a consultant grading procedure for CONSULTANT's performance on each Milwaukee County project. The Project Manager will grade CONSULTANT's performance and share preliminary grading with the CONSULTANT. CONSULTANT will have an opportunity to review and comment on the performance report. The final report along with CONSULTANT comments will become part of the Project file and will also be added to a database tabulating all such performance ratings (see **Attachment "K"**).

9. COUNTY RIGHTS OF ACCESS AND AUDIT

9.1 The Contractor, Lessee, or other party to the contract, its officers, directors, agents, partners and employees shall allow the County Audit Services Division and department contract administrators (collectively referred to as Designated Personnel) and any other party the Designated Personnel may name, with or without notice, to audit, examine and make copies of any and all records of the Contractor, Lessee, or other party to the contract, related to the terms and performance of the Contract for a period of up to three years following the date of last payment, the end date of this contract, or activity under this contract, whichever is later. Any subcontractors or other parties performing work on this Contract will be bound by the same terms and responsibilities as the Contractor. All subcontracts or other agreements for work performed on this Contract will include written notice that the subcontractors or other parties understand and will comply with the terms and responsibilities. The Contractor, Lessee, or other party to the contract, and any subcontractors understand and will abide by the requirements of Section 34.09 (Audit) and Section 34.095 (Investigations Concerning Fraud, Waste, and Abuse) of the Milwaukee County Code of General Ordinances.

10. OWNERSHIP OF DOCUMENTS

10.1 Upon completion of the Project or upon termination of this Agreement, it is understood that all completed or partially completed data, drawings, records, computations, survey information, and all other material that CONSULTANT has collected or prepared in carrying out this Agreement shall be provided to and become the exclusive property of the County. Therefore, any reports, information and data, given to or prepared or assembled by CONSULTANT under this Agreement shall not be made available to any individual or organization by CONSULTANT without the prior written approval of the OWNER (see **Attachment "H"**).

No reports or documents produced in whole or in part under this Agreement shall be the subject of an application for copyright by or on behalf of the CONSULTANT.

10.2 CONSULTANT further understands that oral and written communications with OWNER regarding CONSULTANT'S services under this Agreement are confidential. No aspect of CONSULTANT'S services may be discussed with any individual or organization other than OWNER, unless CONSULTANT receives prior written authorization from OWNER for such discussion.

10.3 If CONSULTANT'S services are terminated prior to completion of the Project, OWNER will indemnify and hold CONSULTANT and CONSULTANT's subconsultants harmless for costs or claims for damages arising out of use the of incomplete documents, interpretation, revision, alteration, or omission to the documents which are not made by CONSULTANT or subconsultants . Should OWNER reuse documents, created by CONSULTANT, the seals and certifications of CONSULTANT and subconsultants shall be invalid, shall not be used and shall be deleted and OWNER will indemnify and hold CONSULTANT and CONSULTANT'S subconsultants harmless for cost or claims for damages arising out of the reuse of the documents.

11. EQUAL EMPLOYMENT OPPORTUNITY

11.1 In accordance with Section 56.17 of the Milwaukee County Code of General Ordinances and Title 41 of the Code of Federal Regulations, Chapter 60, CONSULTANT certifies as to the following:

11.1.1 Non-Discrimination

.1 The CONSULTANT shall not discriminate against an employee or applicant for employment because of race, color, national origin or ancestry, age, sex, sexual orientation, gender identity and gender expression, or disability, marital status, family status, lawful source of income or status as a victim of domestic abuse, sexual assault or stalking, which includes, but is not limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising; lay-off or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

.2 The CONSULTANT shall post in conspicuous places, available to employees, notices to be provided by the County, setting forth provisions of non-discrimination clause.

.3 A violation of this Section 11 shall be sufficient cause for OWNER to terminate this Agreement without liability for uncompleted portion or for materials or services purchased or paid for by CONSULTANT for use in completing this Agreement.

11.1.2 Affirmative Action Program

.1 CONSULTANT shall strive to implement principles of equal employment opportunity through an effective affirmative action program, which shall have as its objective to increase the use of women, minorities, and persons with disabilities and other protected groups, at all levels of employment in all divisions of CONSULTANT's work force, where these groups may have been previously under-used and under-represented.

.2 In the event of dispute of compliance with these requirements, CONSULTANT shall be responsible for showing that the requirements have been met.

11.1.3 Affirmative Action Plan

.1 CONSULTANT shall certify that if it has fifty (50) or more employees, a written affirmative action plan has been filed or will be developed and submitted (within 120 days of contract award) for each establishment. File current Affirmative Action plans, if required, with one of the following: The Office of Federal Contract Compliance Programs, the State of Wisconsin, or the Milwaukee County Department of Audit, 633 W. Wisconsin Avenue, 9th Floor, Milwaukee, Wisconsin 53203. If a current plan has been filed,

indicate where filed _____ and the year covered _____

.2 The CONSULTANT shall require lower-tier subcontractors who have fifty (50) or more

employees to establish similar written affirmative action plans.

11.1.4 Non-Segregated Facilities

CONSULTANT shall certify that it does not and will not maintain or provide segregated facilities for employees at its establishments, and that employees are not permitted to perform their services at a location under its control where segregated facilities are maintained.

11.1.5 Subconsultants

CONSULTANT shall certify that certifications regarding non-discrimination, affirmative action program, and non-segregated facilities have been obtained from proposed subconsultants that are directly related to contracts with Milwaukee County, if any, prior to the award of subcontracts, and that such certification will be retained.

11.1.6 Reporting Requirement

Where applicable, CONSULTANT shall certify compliance with reporting requirements and procedures established in Title 41 Code of Federal Regulations, Chapter 60 (Equal Opportunity Employment).

11.1.7 Employees

CONSULTANT shall certify that _____ employees are in the Standard Metropolitan Statistical Area (Counties of Milwaukee, Waukesha, Ozaukee, and Washington, Wisconsin) and that it has _____ employees in total.

11.1.8 Compliance

CONSULTANT shall certify that it is not currently in receipt of outstanding letters of deficiencies, show cause, probable cause, or other notification of non-compliance with EEO regulations.

12. TERMINATION OF AGREEMENT

12.1 This Agreement may be terminated by either party upon seven (7) days written notice should the other party fail substantially to perform in accordance with the terms of this Agreement through no fault of the party initiating the termination.

12.2 This Agreement may be terminated by the OWNER without cause upon at least seven (7) days written notice to CONSULTANT.

12.3 OWNER's obligation for CONSULTANT'S services rendered to the date of termination shall be for that proportion of fee earned, plus retainage and authorized Reimbursable Expenses.

12.4 In the event of termination completed or partially complete work materials prepared by CONSULTANT in conduct of this Agreement shall be provided to and become the property of OWNER.

12.5 This Agreement shall terminate on December 31 of the calendar year in which the Agreement was executed, unless mutually extended in writing.

13. SUCCESSORS AND ASSIGNS

This Agreement is binding upon the OWNER, the CONSULTANT, and their respective successors, assigns, and legal representatives. Neither shall assign, sublet, nor transfer its interest in this Agreement without the prior written consent of the other.

14. APPLICABLE LAW

This Agreement shall be governed by the Laws of the State of Wisconsin.

15. INDEPENDENT CONTRACTOR

Nothing contained in this Agreement shall constitute or be construed to create a partnership or joint venture between OWNER or its successors or assigns and CONSULTANT or its successors or assigns. In entering into this Agreement, and in acting in compliance herewith, CONSULTANT is at all times acting and performing as an independent contractor, duly authorized to perform the acts required of it hereunder.

16. PROHIBITED PRACTICES

16.1 CONSULTANT during the period of this Agreement shall not hire, retain or utilize for compensation any member, officer, or employee of Milwaukee County or any person who, to the knowledge of CONSULTANT, has a conflict of interest with Milwaukee County.

16.2 CONSULTANT hereby attests that it is familiar with Milwaukee County's Code of Ethics which states, in part, "No person may offer to give to any County officer or employee or his immediate family, and no County officer or employee or his immediate family, may solicit or receive anything of value pursuant to an understanding that such officer's or employee's vote, official actions or judgment would be influenced thereby."

17. EXTENT OF AGREEMENT

17.1 This Agreement represents the entire and integrated Agreement between the OWNER and the CONSULTANT and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement shall not be superseded by provisions of contracts for design or construction and may be amended only by a written instrument signed by both the OWNER and the CONSULTANT.

17.2 Nothing contained herein shall be deemed to create any contractual relationship between the CONSULTANT and any of the contractors, subcontractors, or material suppliers on the Project; nor shall anything contained herein be deemed to give any third party any claim or right of action against the OWNER or the CONSULTANT which does not otherwise exist without regard to this Agreement.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION SPECIFICATIONS

18.1 The award of this contract is conditioned upon the Good Faith Efforts (GFE) put forth by the bidder/proposer in achieving this contract's assigned Disadvantaged Business Enterprise (DBE*) goal. The bidder/proposer shall operate in good faith to ensure that DBEs have opportunities to participate on this contract.

18.2 **DBE Goal**: This contract's DBE participation goal is __%. For purposes of responsiveness, this participation goal shall be met based upon the dollar value of the base bid, initial offer or initial scope of work. As it may be in the best interest of Milwaukee County to accept the inclusion of alternates, or a best-final offer, approval of DBE participation shall be based upon total contract award. Likewise, if the successful contractor/consultant receives additional work on the contract, e.g., change orders, addendums, use of allowances, etc., DBE participation shall be based upon the revised contract total. **Contractors/Consultants, who are also DBE firms, must perform** at least thirty (30) percent of the contract with their own work force.

PRIOR TO BID/PROPOSAL OPENING

18.3 As a matter of responsiveness, the contractor/consultant shall submit with its original bid/proposal, the completed ***Subcontractor/Subconsultant/Supplier Information Sheet*** (**DBE-02**) and the signed and notarized ***Commitment to Contract with DBE*** (**DBE-14**) form(s) detailing the participation plan being proposed to meet or exceed this contract's participation goal. In the event the contractor/consultant is not successful in meeting the DBE goal, a complete ***Certificate of Good Faith Efforts*** (**DBE-01**) form and all relevant documentation shall be submitted with the bid/proposal in addition to the aforementioned forms. CBDP reserves the right to reject a bid/proposal, as non-responsive, if the required documentation is not submitted with the original bid/proposal.

18.4 Milwaukee County's Community Business Development Partners Department (CBDP) determines the sufficiency of the intended contract awardee's good faith efforts undertaken to achieve the assigned DBE participation goal. These efforts are proven by doing either of the following:

a. Evidencing that it has met the DBE participation goal by submitting with its bid/proposal a signed and notarized ***Commitment to Contract with DBE*** (**DBE-14**) form for each DBE documenting sufficient participation; or

b. Documenting the good faith efforts made to meet the DBE participation goal, even though it did not succeed in achieving the goal. In this case, the contractor/consultant shall submit the ***Certificate of Good Faith Efforts*** (**DBE-01**) and all relevant documentation, which will include a signed and notarized ***Commitment to Contract with DBE*** (**DBE-14**) form for each DBE documenting the participation achieved toward satisfying the goal, with its bid/proposal. CBDP is prohibited from ignoring *bona fide* good faith efforts when making determinations on requests for modification of the contract goal, in whole or part. Determinations are made on a contract-by-contract basis.

18.5 The efforts employed by the contractor/consultant should be those that one could reasonably expect to be taken if the contractor/consultant were actively and aggressively trying to obtain DBE participation sufficient to meet the goal. Mere pro forma efforts are not good faith efforts. (49 CFR, §26.53, and Appendix A to 49 CFR, Part 26, provide guidance regarding GFE).

18.6 In the event CBDP determines that the contractor/consultant has failed to meet the GFE requirements, the contractor/consultant is entitled to appeal this determination. The provisions of 49 CFR, §26.53(d), apply to such an appeal.

18.7 Listing a DBE on the ***Commitment to Contract with DBE*** (**DBE-14**) form shall constitute a written representation and commitment that the contractor/consultant has communicated and negotiated directly with the DBE firm(s) listed and secured actual pricing from the DBE firm. If awarded the contract, the contractor/consultant shall enter into contract agreement, directly or through subcontractors, with each DBE firm listed on the ***Commitment to Contract with DBE*** (**DBE-14**) form(s) for the work and price set forth thereon. The agreement(s) must be submitted to CBDP within seven (7) days from receipt of the "Notice-to-Proceed" or execution of the purchase order.

18.8 The DBE participation credited towards the contract goal for both DBE and non-DBE prime contractors is calculated on the following criteria and is further identified in 49 CFR §26.55:

a. Prime Contractor shall count towards the DBE requirement and be credited one hundred percent (100%) of expenditures to DBE firms, if all of the identified scope of work has a commercially useful function in the actual work of the contract and is performed directly by the listed certified DBE firm. CBDP through the application of 49 CFR §26.55(c) is responsible for the determination and evaluation of whether or not the firm is performing a commercially useful function on this project.

b. Prime Contractor shall be credited with one hundred (100%) percent for the work performed by the DBE subcontractor with its own forces. If a DBE further subcontracts a portion of its work to another firm, the value of the subcontracted work will not be counted towards the DBE goals unless the work is performed by another DBE firm. The Prime Contractor will be given credit for the cost of material and supplies obtained by the DBE and installed by the DBE for work on the contract. The Prime Contractor will also be given credit for the cost of equipment leased by a DBE subcontractor provided the equipment is not leased from the prime contractor or its affiliates.

c. Prime Contractor shall be credited with one hundred percent (100%) of the expenditures to DBE manufacturers. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises goods from raw materials or substantially alters the materials or supplies obtained by the contractor.

d. Prime Contractor shall be credited with sixty (60%) of the expenditures for materials or supplies purchased from a certified DBE regular dealer.

A Regular Dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies are kept in stock, and regularly sold to the public in the usual course of business. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns or operates distribution equipment.

Brokers, packagers and manufacturers' representatives or other persons who arrange or expedite transactions are not regarded as regular dealers within the meaning of section 26.55.

e. Prime Contractor shall be credited one hundred percent (100%) for the fees or commissions charged for assistance in the procurement of material and supplies. A prime contractor shall also be credited with one hundred (100%) percent for fees or transportation charges for the delivery of material or supplies by a DBE to a job site provided that the County determines that the fee is reasonable and not excessive as compared with fees customarily allowed for similar services. The cost of the material and supplies will not be credited towards its DBE goals.

f. Prime Contractor shall be credited with one hundred percent (100%) of transportation expenditures with DBE trucking firms provided the DBE firm is responsible for the management and supervision of the entire trucking operation for which it has contracted. The DBE must also use trucks it owns, insures, and operates using drivers it employs. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract. The DBE may also lease trucks from a non-DBE firm, including an owner-operator; however, the DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE. (Concrete ready mix operations will not receive credit for leased concrete delivery trucks from non-DBE firms).

g. Contractor/Consultant is required to notify the County Contract Administrator and CBDP if any DBE contractor(s) working on this contract will sublet any portion of their work on this project. Work will be credited based on actual participation by DBE firms.

18.9 Contractors/Consultants should note that for the purpose of determining compliance with the DBE requirements of this contract, only DBEs certified by the State of Wisconsin Unified Certification Program (UCP) prior to the bid/proposal submission deadline count towards the satisfaction of the goal. If a bidder/proposer wishes to utilize a DBE certified in another state for credit on this contract, the bidder/proposer shall include a copy of DBE certification from the home state along with its good faith efforts documentation upon submission of bid/proposal as a matter of responsiveness. Additionally, any such named DBE must apply for certification with the Wisconsin UCP prior to bid opening or proposal due date. For assistance related to certified DBE firms, contact the Certification and Compliance Administrator at (414) 278-4747.

18.10 When evaluating a contractor/consultant's proposed DBE commitment, Milwaukee County reserves the right to request supporting documentation from both the contractor/consultant and any listed DBE. If the information requested is not submitted by the contractor/consultant within the time specified for such submission, Milwaukee County may determine the contractor/consultant to be non-responsive and thereby remove them from further consideration for contract award.

FOLLOWING CONTRACT AWARD

18.11 When evaluating the performance of this contract after execution, Milwaukee County reserves the right to conduct compliance reviews and request, both from the contractor/consultant and any subcontractors/ subconsultants or material suppliers, documentation necessary to verify actual level of DBE participation. If the contractor/consultant is not in compliance with these specifications, CBDP will notify the contractor/consultant in writing of the corrective action that will bring the contractor/consultant into compliance. If the contractor/consultant fails or refuses to take corrective action as directed, Milwaukee County may take one or more of the actions listed below:

a. Terminate or cancel the contract, in whole or in part;

b. Remove the contractor/consultant from the list of qualified contractors/consultants and refuse to accept future bids/proposals for a period not to exceed three (3) years;

c. Impose other appropriate sanctions, including withholding any retainage or other contract payments due which are sufficient to cover the unmet portion of the DBE contract commitment, where the failure to meet the DBE contract commitment is the result of a finding by CBDP of less than adequate good faith efforts on the part of the contractor/consultant; and/or

d. If the contractor/consultant has completed its contract, and the DBE contract commitment was not met due to an absence of good faith on the part of the contractor/consultant as determined as determined under 49 CFR, Part 26, the parties agree that the proper measure of damages for such non-compliance shall be the dollar amount of the unmet portion of the DBE contract commitment. The County may in such case retain any unpaid contract amounts otherwise due the contractor/consultant, up to the amount of the unmet DBE contract commitment. If insufficient funds remain in the contract account to compensate the County up to that amount, Milwaukee County may bring suit to recover damages up to the amount of the unmet commitment, including interest at the rate of 12% annually, plus the County's costs, expenses and actual attorney's fees incurred in the collection action.

18.12 Contractor/Consultant shall be credited for expenditures to DBE firms toward the requirements, if the entire identified scope of work has a commercially useful function in the actual work of the contract and is performed directly by the listed DBE firm. CBDP, through the application of 49 CFR, §26.55(c), is responsible for the determination and evaluation of whether or not the firm is performing a commercially useful function on this project.

18.13 After the execution of the contract, contractor/consultant must submit copies of executed **Subcontract Agreement(s)** for each DBE firm listed on the contract. Attach agreements to the first payment application. **APPLICATIONS FOR PAYMENT WILL NOT BE PROCESSED IF AGREEMENTS ARE NOT SUBMITTED AS REQUESTED**. In addition, **contractor/consultant** shall document that each DBE is notified at least three (3) working days before start of their subcontract work.

18.14 Contractor/Consultant is required to notify the County Contract Administrator and CBDP if any DBE contractor(s) working on this contract will sublet any portion of their work on this project. Work will be credited based on actual participation by DBE firms.

18.15 Contractor/Consultant must maintain DBE participation and performance logs. If the DBE firm(s) cannot perform, if the contractor/consultant has a problem in meeting the goal, or any other problem relative to these requirements, the contractor/consultant shall immediately contact CBDP at (414) 278-4747. The prime contractor/consultant must submit written notification of desire for substitution to the DBE affected, and forward a copy to CBDP, specifying the reason for the request, including the performance log. Any DBE so notified has five (5) business days to provide written objection/acceptance to the prime making the notification. The "right to correct" must be afforded any DBE objecting to substitution/termination for less than good cause as determined by CBDP (Refer to 49 CFR §26.53). Approval must be obtained from CBDP prior to making any substitutions. DBE contractors are also required to notify and obtain approval from CBDP prior to subletting work on this project.

18.16 **Requests For Payment**: A ***DBE Utilization Report*** (**DBE-16**) form shall be submitted with each payment request by the contractor/consultant after contract award. This report must cover the period from the start of the project to the end of each period covered by the request for payment being

submitted. This report must be submitted even if no DBE activity took place during the period being reported. Contractor/Consultant must indicate on the AIA Document ***G703 - Continuation Sheet***, or similar, work being performed by DBEs by either a) placing the word "DBE" behind the work item or b) breaking out the work done by DBEs at the end of the report. Contractor/Consultant shall notify DBEs of the date on which they must submit their invoices for payment. Failure to submit required forms with requests for payment will result in denial of payment, or other sanctions deemed appropriate by Milwaukee County, including those listed in Section 11, above.

18.17 **Final Payment Verification**. Contractor/Consultant shall submit a ***Contract Close-Out DBE Payment Certification*** (**DBE-18**) form completed by the contractor/consultant and each DBE along with its final request for payment, in addition to a final ***DBE Utilization Report*** (**DBE-16**) covering the entire project. Milwaukee County will not process the final request for payment without inclusion of these required forms.

18.18 Milwaukee County has a revolving loan program for DBE firms. The program is administered by CBDP. Should the Prime Contractor utilize a DBE that is a participant in this revolving loan program, the contractor will cooperate fully and completely with the County to facilitate repayment of said loan. Said cooperation includes, but is not limited to, written information regarding balance of DBE subcontractor's contract, prior payment (two or three party) agreements, and the issuance of two-party checks payable in the name of Milwaukee County and the DBE indebted to the County under the revolving loan program

18.19 Milwaukee County reserves the right to waive any of these specifications when it is in the best interest of the County and with the concurrence of CBDP.

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTR ATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

MANPOWER, DIRECT SALARY RATE AND OVERHEAD & PROFIT FACTOR SCHEDULE
Used For Basic Services & Additional Services
Separate Schedule Required for Prime Consultant & each Subconsultant

Firm Name: _____ Principal-in-Charge: _____

Wisconsin Reg. Number: _____

Principal's Flat Rate: ..... $_____/hr.

Overhead & Profit Factor (multiplier): ..... . _____

(Include copy of audited account of overhead factor or complete **Attachment "B-2")**

Name	Classification	Direct Salary Rate/Hour
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Direct Salary Rate is defined as each employee's actual and verifiable gross hourly cost of salary ("W-2" Statement Salary), exclusive of incentive bonus or other non-direct salary expenses.

Overhead & Profit Factor is defined as the multiplying factor representing each employee's pro-rata share of all other direct and indirect expenses and profit for the CONSULTANT. This factor remains fixed for the life of the Project.

Additions and deletions of personnel or permanent classification changes must be submitted for approval at the time the changes occur. For multi-year projects, changes in basic salary rates may be submitted for approval only in January of each calendar year.

The foregoing is a true and
actual accounting of the rates:

As of: _____, 20____

_____
Signature

_____
Title

Approved for Milwaukee County
Department of Administrative Services,
Facilities Management Division

Date: _____

_____
Signature

_____
Title

If your firm does not possess a FAR audit certified rate, please complete the following:

Overhead Rate = _____ **(Without Profit)**

_____does not have an audit-certified
(Name of Firm)

The above rate calculation, which includes all non-direct costs considered to be proper and appropriate to the provision of professional services covered by this Annual Consultant Agreement for Professional Services, was prepared in accordance with the standards of:

_____
(Accounting Practice Used)

It is understood and agreed that no direct charge will be made for labor or expenses included in the Overhead Rate Factor.

Signature: _____ Date: _____

Title: _____

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

GUIDELINES FOR REIMBURSABLE EXPENSES

GENERAL
Milwaukee County reimburses consultants under contract for expenses in connection with authorized out-of-town travel; long distance communications; fees paid to approving authorities; reproductions which are products of service; requested renderings, presentation models and mockups; and the expenses of requested additional insurance coverage. There may be other qualifying reimbursable expense items if the project or circumstances are unique and terms concerning them are contained in an approved and signed contract. These guidelines are intended to clarify the County's general policies concerning payments for reimbursable items.

DEFINITION
Reimbursable expenses are out-of-pocket expenses incurred by the consultant and consultant's employees in direct support of the project. Over and above compensation for Basic and Additional Services, they are unique and non-recurring costs. By their nature, the cost is not predictable in advance of occurrence.
Approved reimbursable expenses are billed at the same cost paid by the consultant and are not subject to retainage provisions found in Milwaukee County service agreements.

DOCUMENTATION
Most reimbursables can be documented by presenting a copy of the original sales slip or invoice clearly highlighted, dated, and labeled with the appropriate job number/name and person incurring the expense. When the original charge has been recorded on an employee expense log, an in-house printing or copy log, or on a phone bill printout, for examples, a copy of the appropriate log or journal can be submitted as long as the costs are clearly highlighted, dated and labeled. All documentation must be attached to a cover sheet which itemizes and sub-totals the charges, by type. The documentation and cover sheet is attached to the consultant's monthly invoice.

REIMBURSABLES BUDGET ALLOWANCE
All agreements shall establish a pre-approved budget allowance for the total out-of-pocket reimbursable expenses of consultant's. Changes to the approved allowance total require a written amendment to the consultant's contract. As part of final contract negotiations, the consultant shall prepare an itemized budget estimate for reimbursables for review and approval by the County. Special care should be taken to differentiate those out-of-pocket expenses that will be initially borne by the consultant and those that will be paid directly by the County (under a separate County Services line item in the project budget).

AUTHORIZED OUT-OF-TOWN TRAVEL
Reimbursable travel expenses can accrue for both travel to and from Milwaukee for work in connection with a project if that travel involves a distance greater than a 100 mile radius from Milwaukee **or if the consultant's working office is more than 100 miles from Milwaukee.** Milwaukee County will reimburse consultant's for reasonable expenses incurred for such transportation, subsistence and lodging. Mutual agreement about what constitutes an authorized travel expense begins at the time of contract negotiations when the budget for these items is established and continues as the project proceeds. Milwaukee County policy is to pay for essential, not luxury, services.

Whenever possible, air travel dates should be planned in advance to take advantage of the lowest coach fares available on connecting airlines; Milwaukee County does not pay for first-class or business-class travel.

Daily rental car rates are rarely competitive with airport van or taxi fares to and from the airport, hotel and project meeting sites. Consultants should confer with Milwaukee County's project manager regarding the most reasonable and cost-effective means for transportation while in Milwaukee.

If traveling by personal car, the total mileage may be charged at the prevailing cost per mile rate allowed by the Internal Revenue Service. Highway tolls and parking fees for out of town consultants are also reimbursable, if properly documented and if the consultant's office is more than 100 miles from Milwaukee.

Meals reimbursement qualifies if the consultant's employees are required to eat in restaurants in connection with an out-of-town (100 mile radius) visit/trip directly in service of the project. The consultant's choice of restaurants should be modest in every circumstance. Milwaukee County does not pay for meals taken in first-class restaurants, for cocktails, or for entertaining guests or in-town project team members. Milwaukee County discourages the scheduling of a business meeting over a meal period, thus avoiding the question of which meals might be authorized for reimbursement. Check with Milwaukee County's project manager if you are uncertain about which kind of meal expenditure might be disallowed.

Lodging costs at medium-priced accommodations will be approved. Deluxe accommodations and charges involving personal services of any kind will be disallowed.

LONG DISTANCE COMMUNICATIONS
Milwaukee County will reimburse the consultant for properly documented long distance telephone tolls made for project business.

FEES PAID TO APPROVING AUTHORITIES
Milwaukee County will reimburse the cost of fees paid for securing the approval of authorities having jurisdiction over the project. Consultants should plan for this expense in advance, because cutting County checks to coincide with dates of submittal cannot usually be done. The County will accept, however, an out-of-sequence invoice covering an unusually high plan exam fee in order to minimize the inconvenience to the consultant.

REPRODUCTIONS AND REPROGRAPHICS
The cost of drawings, specifications, reports, exhibits and other documents which are products of service are reimbursed with proper documentation. Charges for postage, handling and shipping of reproductions are considered overhead expenses and are not reimbursed. Bid sets, which are often the most expensive segment of the out-of-pocket expense paid by the consultant, are sometimes contracted for by the County on larger jobs that could benefit from competitive bidding for that service. Consult with the County project manager if the furnishing of bid sets is not specifically excluded form consultant's reimbursable allowance budget.

ADDITIONAL INSURANCE
When additional insurance coverage or limits, over and above that normally carried by a consultant is specifically requested by the County, the County will reimburse that additional premium cost. Specific documentation will be requested by the County project manager if this expense qualifies as reimbursable.

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES FACILITIES MANAGEMENT DIVISION

INVOICE FOR CONSULTING SERVICES INVOICE # _____
(Lump Sum Contract Form)

DATE: _____

PROJECT TITLE: _____

_____

PROJECT NO.: _____

CONSULTANT: _____

SERVICES FOR THE MONTH ENDING: _____

_____

1.) BASIC SERVICES (**Attachment "D-2"**):

2.) REIMBURSABLE EXPENSES (**Attachment "D-2"**):
(Attach itemization and back-up copies of all charges)

3.) ADDITIONAL SERVICES (**Attachment "D-3"**):
(Attach itemization for each service by name, classification, direct salary rate x O.H. factor x man hours)

TOTAL THIS MONTH:

LESS: Retainage @ 5% (On Items 1. & 3. Only)……..

CURRENT PAYMENT DUE:
(Attach continuation sheet, D-2, on job status)

Approved for Billing:

_____
Consultant

_____
Signature

Approved for Milwaukee County
Department of Administrative Services
Facilities Management Division:

_____
Signature

_____
Title

_____
Date

MILWAUKEE COUNTY DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

CONSULTANT INVOICE CONTINUATION SHEET FOR REPORTING JOB STATUS PROJECT NO.: _____

CONSULTANT: _____ INVOICE # _____

Basic Services	Fee Limit Per Phase/ or Totals	Previously Billed	Billed This Month	Percent Complete (%)	Total Billed To Date	Retainage To Date	Balance To Completion
Program, Master Plan							
Schematic Des							
Design Dev.							
Contract Doc.							
Bidding							
Const. Admin.							
Subtotal							
Reimbursables (Itemized)	$			N.A.		N.A.	
Subtotal							
Additional Services (Itemized) INCR.	$						
Subtotal							
Totals							

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

INVOICE FOR ADDITIONAL CONSULTING SERVICES ONLY — INVOICE #_____
(Multiple of Direct Salary Rate Form)
(One FORM "D-3"/Ea. Increase/Billing) — Fee Increase # _____

DATE: _____ — Fee Increase Total $_____

PROJECT TITLE: _____

PROJECT NO.: _____

CONSULTANT: _____

SERVICES FOR THE MONTH ENGING: _____

1.) **CONSULTANT LABOR** (Refer to approved Manpower Direct Salary Rate & O.H. Factor Schedule)

Name	Classification	Direct Sal. Rate/Hr.		OH Factor		Man Hrs		Cost
_____	_____	$	x	x		_____	=	_____
_____	_____	$	x	x		_____	=	_____
_____	_____	$	x	x		_____	=	_____
_____	_____	$	x	x		_____	=	_____
_____	_____	$	x	x		_____	=	_____

Subtotal _____

2.) **SUBCONSULTANTS**
(Attach itemizations in same form as above) Subtotal _____

3.) **REIMBURSABLE EXPENSES**
(Attach itemization and backup copies of all charges) Subtotal _____

TOTAL THIS MONTH:

LESS: Retainage @ 5% (On Items 1. & 2. Only)……..

CURRENT PAYMENT DUE:
(Attach continuation sheet on job status)

Approved for Billing:

Approved for Milwaukee County
Department of Administrative Services
Facilities Management Division:

_____ Consultant

_____ Signature & Date

_____ Signature

_____ Title

DBE RFP LANGUAGE INSERT

NOTE: This language is typically inserted before or after the Affirmative Action/EEO Requirements sections.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION

The award of this contract is conditioned upon your good faith efforts in achieving this project's Disadvantaged Business Enterprise (DBE) goal of __**%**, and you must document those efforts. Your Proposal must state how you will meet the goal, including identifying the DBE firm(s) by name, the scope(s) of work/service(s) to be provided, the dollar amount(s) of such work, and the percentage of the DBE goal to be met. Failure to do this will result in a determination of non-responsiveness, and rejection of your Proposal will occur. During the Contract, the successful Proposer will use the County's online reporting system to document DBE participation. The *Disadvantaged Business Enterprise (DBE) Requirements* and forms to be used are attached in this RFP.

A necessary step in the good faith efforts process is contacting Community Business Development Partners (CBDP) at 414-278-4747 or cbdp@milwaukeecountywi.gov for assistance in identifying DBEs and understanding the County's DBE Program procedures. The official directory of eligible DBE firms can be accessed by the following link:

https://app.mylcm.com/wisdot/Reports/WisDotUCPDirectory.aspx

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTR ATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

COST & SCHEDULING SYSTEM REQUIREMENTS

GENERAL

SureTrak and Expedition are software packages produced by Primavera Systems, Inc. This software, in addition to Microsoft Project, is used by Milwaukee County.

Requirements According To Agreement Size
Schedule and control services using Sure Trak or Microsoft Project software are required for this project to the degree listed below:

A. For consultant services agreements with fees up to $50,000, FACILITIES MANAGEMENT DIVISION staff will enter schedule and control information on FACILITIES MANAGEMENT DIVISION's contract management information system. Prime Consultant shall provide scheduling information requested by FACILITIES MANAGEMENT DIVISION according to the needs of the project.

B. For consultant agreements with a fee range from $50,000 to $500,000, Prime Consultant shall use Microsoft Project and provide scheduling information determined necessary by FACILITIES MANAGEMENT DIVISION according to the needs of the project. Milwaukee County will use Primavera Contract Manager for contract cost control.

C. For consultant services contracts over $500,000, consultant shall use Microsoft Project and provide scheduling information determined necessary by FACILITIES MANAGEMENT DIVISION according to the needs of the project. Milwaukee County will use Primavera Contract Manager for contract cost control.

SCHEDULE DEVELOPMENT
Before work begins, the Prime Consultant shall prepare a Baseline Schedule of the work scope in Critical Path Method form. Milwaukee County will furnish an activity coding format to facilitate reports and graphics used in project management activities. The Prime Consultant shall submit the completed schedule for review and approval (cd disc format or electronic mail) by FACILITIES MANAGEMENT DIVISION's project manager. The review will confirm the following: that the schedule is complete and reflects a realistic work plan; that the total schedule costs equal the contract values; that there is a defined, justifiable critical path with design activity durations subdivided into periods less than 20 working days or $10,000 value; that responsible parties are assigned; and that all the key project milestone dates are recorded. Milwaukee County approval of the Baseline Schedule is required before any pay request from the Prime Consultant can be processed.

The consultant is responsible for information required to develop the schedule. Content includes work operations, sequencing, activity breakdown and time estimates. Milwaukee County may require additional schedules or reports to verify timely completion of scheduled activities and project milestones.

On a monthly basis, the consultant shall review the schedule and report on actual performance, i.e., the actual start and finish dates and durations, work performed since the last update, description of problem areas, delaying factors and their impacts, and corrective actions taken. The Prime Consultant shall also update the current schedule, identifying changes in network logic, work sequences and durations needed to meet contract requirements, and contract time adjustments, when authorized by Milwaukee County. Each schedule update will be submitted to the County project manager for approval on 3.5" discs or through electronic mail, concurrent with submittal of consultant's monthly invoice for professional services. Pay applications will not be processed if updated schedule with all information required is not submitted. Copies of approved schedule updates shall be distributed to other members of project teams with instructions to recipients to promptly report discrepancies and problems anticipated by projections shown in the schedule.

I. RECORD DOCUMENTS

The Prime Consultant shall prepare and file record documents of the project with Milwaukee County DEPT. OF ADMINISTRATIVE SERVICES - FACILITIES MANAGEMENT DIVISION, as per this attachment. Prime Consultant agreement close-out and final payment will be contingent on approval of complete record document submittal by Prime Consultant.

II. ELECTRONIC MEDIA REQUIREMENTS

A. Produce Project Manuals, Reports, and other permanent records in an electronic word processing format that can be read by Microsoft Office 2013, Microsoft Office 365 or newer. Produce Project Manual technical sections in Milwaukee County format. Obtain electronic formats for Project Manual technical sections through the Architect/Engineer of record for the Project or contacting John Bunn (414-278-3921}.

These materials shall be submitted on a CD-ROM which adheres to ISO 9660 CD, or CD-ROM XA (Mode 2} format for multi-session CD-ROM.

B. CADD drawings shall be produced in AutoCAD 2013 software, or higher, and be capable of residing on an IBM-compatible computer utilizing Windows 7, Windows 7 Professional, or newer operating systems. Provide drawings in DWG & PDF formats. **Drawings submitted in DXF format will NOT be accepted**.

The Consultant shall use AutoCAD 2013 or newer for AutoCAD engineering drawings.

Obtain Milwaukee County drawing format standards for title blocks and cover sheets: B_1711, D_ 3624, and/ or F_4230 by contacting the Architect/ Engineer of Record for the Project.

AutoCAD drawings shall be submitted on a CD which adheres to ISO 9660 CD, or CD-ROM XA (Mode 2} format for multi-session CD-ROM, and (1} additional copy of drawings on separate CD in PDF format.

III. AUTOCAD DRAWING STANDARDS

The Prime Consultant and his/her sub-consultants shall prepare AutoCAD drawings in accordance with the following document standards:

A. Xref Files, Image Files, Blocks and 3rt1 Party Fonts
   1. XBIND all Xref d files to their drawing(s}. Each individual electronic graphic document must be submitted in a single file format without any external files attached.
   2. Insert all image files in Final Drawing
   3. A document created with multiple files **MUST NOT SHARE LAYER NAMES** among the files.
   4. Provide a **SINGLE DRAWING FILE** for each Drawing Sheet.
   5. While working in Paper Space, **TURN ON VIEW LOCK** to prevent your viewport view from being accidentally altered while moving between Paper Space and Floating Model Space mode.
   6. Purge all drawing files of all unused entities-Blocks, Layers, Fonts
   7. "READ-ONLY" and "LOCKED" drawing files will not be accepted.

B. It is PREFERRED that all final drawings be submitted in Model Space. However, final drawings may be submitted in Paper Space as long as AutoCAD Drawing Standards A-1 through A-7 are adhered to. Drawings must also conform to the following requirements:
   a. Drawings must be referenced to a NAD83 horizontal datum
   b. Drawings must be referenced to the State Plane Wisconsin South FIPS 4803 coordinate system
   c. Drawings must have an origin point referenced to a location within Milwaukee County, with coordinate values that fall within the coordinate system specified above

C. Consultants shall utilize the following Milwaukee County drawing format standards:
   1. Standard text set-up and dimension set-up (**page H-20**)
   2. Standard drawing conversion scale (**page H-21**)
   3. Standard title blocks (**B_1711, 0_3624, E_4230**)
   4. The standard AutoCAD font to be used is **ROMANS.shx**
   5. Sheet sizes to be used, on BOND PAPER, are:

Architectural:	**Engineering:**
A = 9" x12"	Ansi A = 8 1/2" x 11"
B = 12" x 18"	B = 11" x 17"
C = 18" x 24"	C = 17" x 22"
D = 24" x36"	D = 22" x 34"
E = 36" x 48"	E = 34" x 44"
E1 = 30" x 42"	

Drawing Sheet numbers and electronic drawing files shall consist of the following:

1. Alphanumeric discipline designation
   - **A** - Architectural Interiors and Facilities Management
   - **C** - Civil Engineering and Site Work
   - **E** - Electrical
   - **EV** - Environmental
   - **F** - Fire Protection
   - **L** - Landscape Architecture
   - **M** - Mechanical
   - **P** - Plumbing
   - **S** - Structural
2. A maximum of 3 characters for sheet number
   Example: A101.dwg
   I I
   I I_____ Sheet Number
   I_____ Discipline

D. The DOS 8+3 naming convention shall be used for all Drawing Sheet numbers and electronic drawing files (e.g., A101.dwg).

E. Consultants shall utilize the **AIA**, or Milwaukee County Standard Layer Index, including color and line type (**pages H-6 through H-19**); or for approval of your firm's standard layer index.

F. The room attributes shall be provided on all AutoCAD building plans. Window attributes shall be shown on elevation drawings. The following attribute data shall be included:

1. **Rooms**
   Room number (serves as the room tag)
   Dimensions (length, width, height)

2. **Tag number**
   Door size
   Frame size
   Fire rating

3. **Windows**
   Tag number
   Size
   Glazing
   Framing material

IV. GIS RECORD STANDARDS

a. GIS data must be obtained via resources found at: http://mclio.maps.arcgis.com/apps/webappviewer/index.html?id=1d1bc0975f414049ace560b95b377adc
b. GIS data must be edited to match the as-built state, edited to include all changes to all assets affected by the project, including all relevant/affected attributes and geometries, and returned to Milwaukee County

with the same layers, fields, and Esri file geodatabase (.gdb) format as originally obtained via above resource.

c. Editors may edit the GIS data using their preferred software. Suitable commercial software packages that can read and edit the data are available from Esri and Autodesk (e.g. ArcMAP, ArcGIS Pro, AutoCAD Map3D, ect.)

d. Edited data must be returned in a zipped file geodatabase via the upload process documentation & resources found at http://mclio.maps.arcgis.com/apps/webappviewer/index.html?id=1d1bc0975f414049ace560b95b377adc

V. DOCUMENT REQUIREMENTS

A. **Design Documents:** Prepare and submit the following documents to the DAS - Records Management Office with a copy of the transmittal letter submitted to the respective Project Manager:

1. City/State Approved Drawings	(1) Original set
2. Bid Set Drawings	(1) Set BOND PAPER (marked as "ORIGINAL")
	(1) Set electronic file (DWG & PDF)
3. Project Manual	(1) Set hard copy
& Detail Manual	(1) Set electronic file

B. **As-Built/Record Documents:** Prepare and submit the following record documents to the DAS - Records Management Office with a copy of the transmittal letter submitted to the respective Project Manager:

1. As-Built/Record Drawings	(2) Sets BOND PAPER (marked as "ORIGINAL")
	(1) Set electronic file (DWG & PDF)
2. Project Manual	(2) Sets hard copy
& Detail Manual	(1) Set electronic file
3. Operating/Maintenance Manuals	(3) Sets hard copy, (1) set electronic file

The Prime Consultant and his/her sub-consultants shall prepare and submit the required As- Built/Record Drawings and Project Manuals in accordance with the following procedures:

1. Obtain from each Prime Contractor marked-up prints, clarification drawings, shop drawings and/or any other data showing significant changes in the work made during the construction phase, including all changes described in the original addenda.

2. Update the original electronic drawings and project manuals by transferring all addenda and field changes from the contractor's marked-up documents, describing significant changes to the original drawings and project manuals.

   The Prime Consultant shall list all revisions on each drawing and identify each revision with boundaries. Each drawing shall be labeled **AS-BUILT/RECORD DRAWINGS** and **PROJECT and DETAIL MANUAL**, and have them dated and signed by the Principal in Charge.

3. The end product shall consist of a composite set of Record Drawings and Project Manuals accurately showing the as-built, on-site conditions of the entire project.

C. **Studies/Analysis/Survey Reports**: Prepare and submit the following documents to the DTPW Records Management Office with a copy of the transmittal letter submitted to the respective Project Manager:

1. Final Approved Report	(2) Sets hard copy
	(1) Set electronically produced

VI. FINAL DOCUMENT REQUIREMENTS FOR ELETRONIC MEDIA

The Prime Consultant and his/her subconsultants shall prepare and submit:

A. A Drawing Directory consisting of a drawing index, in hard copy and on electronic media, that is sorted by:

1. Property site
2. Building
3. Discipline

And shall include:

4. MILWAUKEE COUNTY Project Number
5. MILWAUKEE COUNTY Site I.D. and Building I.D.
6. MILWAUKEE COUNTY Drawing Name and Description
7. Sheet number
8. Text Style
9. Image Files
10. 3rc1_party Fonts
11. **Layer Log** for each Drawing Sheet including layer name, state (on/off), color, line type, defined blocks, user blocks, dependent blocks and unnamed blocks.

B. Detail Drawings produced as a MANUAL shall include a Drawing Index consisting of the detail title and/or description, and identification number sorted by discipline and page number. The Drawing Index shall be submitted in hard copy and shall be incorporated in the Detail Manual.

C. Consultants shall also submit correspondence outlining all special loading or start-up procedures required to generate the drawings for viewing, manipulating and editing on Milwaukee County DAS's CADD system (AutoCAD 2013).

D. Consultants shall label the CD-ROM identifying:

1. Project Number
2. Project Title with Site I.D. and Building I.D.
3. Name of Consultant Firm and Principal in Charge
4. Date

E. Consultants may insert their logos on Milwaukee County's Standard Cover Sheet with PRIOR APPROVAL from the Architect/ Engineer of record for the project.

Submit the Project Cover Sheet Layout to the Architect/ Engineer of record for review and approval. Consultants **MAY NOT** insert their logos on the Project Drawing Sheets. The consultant firm's name may be inserted in the designated space provided within Milwaukee County's Standard Title Block.

F. For an example of file and layer indexing, please visit http://county.milwaukee.gov/lmageLibrarv/Groups/cntyArchEng/dturzai/09172013forward/SectionHFile LayerIndex2015 .pdf

SUBMIT TO:

MILWAUKEE COUNTY DEPARTMENT OF ADMINISTRATIVE SERVICES ARCHITECTURAL, ENGINEERING & ENVIRONMENTAL SERVICES DIVISION
633 WEST WISCONSIN AVENUE-SUITE 1000
MILWAUKEE, WI 53203

PHONE: 414-278-3986

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

COMPLETE LISTING OF SUBCONSULTANTS
(To Be Completed by Prime Consultant)

DATE: _____

PROJECT TITLE: _____

PROJECT NO.: _____

PRIME CONSULTANT: _____

In the execution of the subject Prime Consultant Agreement, I/We propose to use the following subconsultants:

No.	Name & Address	Type of Service	Principal Contact
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

For Prime Consultant:

_____
Signature

_____
Name

_____
Title

_____
Date

For Milwaukee County
Department of Administrative Services
Facilities Management Division

Approved (No.'s): _____

Rejected/Resubmit (No.'s) _____
_____
_____

_____
Signature

_____
Name

_____
Title

_____
Date

ATTACHMENT "I"

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

SUBCONSULTANT COMPLIANCE CERTIFICATION

DATE: _____

PROJECT TITLE: _____

PROJECT NO.: _____

PRIME CONSULTANT: _____

This is to Certify that I/We:

SUBCONSULTANT NAME: _____

ADDRESS: _____

_____

Shall provide the following subconsulting services to the above named Prime Consultant:

TYPE OF SERVICES: _____

_____

We also certify that if I/We are approved for this project, we shall be bound by all the applicable terms and conditions, including the "Audit and Inspection of Records" requirements, required of the Prime Consultant. No work shall be started until we have an executed Agreement with the Prime Consultant incorporating all of the above requirements.

SUBCONSULTANT

_____ _____
Subconsultant's Name Date

_____ If Principal is a Corporation
Signature IMPRINT CORPORATE SEAL

_____
Title

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION
CONSULTANT AGREEMENT CLOSEOUT CHECKLIST

Consultant: _____

Project Title: _____

Project No.: _____

Agreement (Contract) No.: _____ Effective Date: _____

Type Agreement: A: ___ B (Annual): ___ C: ___ D: ___

Consultant Selection Documentation in File: Yes No

These deliverable item from the consultant must be in the FACILITIES MANAGEMENT DIVISION Project (job) File:

☐ Final Project Program Report (Sec. 3.1.3) (*Scope of project as agreed by all parties*)

☐ Final Estimate of Probable Construction Costs (Sec. 3.4.2) (*Submitted before bid process begins*)

☐ Copies of all State and Local Plan Examination approvals and receipts for paid application fees (Sec. 3.5.2.2)

☐ Project Manual and all addendum originals (Sec. 3.4.2, 3.5.2.3)

☐ Written recommendation as to Substantial Completion and final acceptance of the project (Sec. 3.6.2, 5.4.1.1) (AIA Form G704)

☐ Written confirmation of compliance of the Work with Contract Documents (sec. 3.6.2) (WI Commercial Bldg. Code, Form SBDB-9720)

☐ Final updated cost loaded schedule (Attachment “G-1”)

☐ Record documents (Attachment “H-1”) are accessible and useable _____

Note - Signature no longer required. Use Record Document BP for record document closeout.

☐ Operation and maintenance manuals and data (CONSULTANT approved)

☐ Confirmation of Site Clean-Up (*i.e., environmental or geotechnical soil cuttings, purge water*)

☐ DBE Participation (Attach Approved Final Utilization Report): DBD-018PS

All of the above items applicable to this project have been submitted

Prime CONSULTANT Signature: _____

County Project Manager Approval: _____ Date: _____

SCORE: _____

MILWAUKEE COUNTY
DEPARTMENT OF ADMINISTRATIVE SERVICES, FACILITIES MANAGEMENT DIVISION

CONSULTANT EVALUATION FORM

Consultant: _____

Consultant P.M.: _____

Project Title: _____

Project No.: _____ Contract No.: _____

Date of Evaluation: _____ Evaluation Form Completed By: _____

Basic Services Provided by the CONSULANT: _____

_____

_____

Please circle the Appropriate Response:
Performance Assessment:

I. Quality of Work:
- (4) Satisfied/Above Average
- (3) Acceptable/Average
- (2) Marginally Acceptable/Below Average
- (1) Unacceptable

Comments: _____

_____

II. Adherence to Schedule/Timeliness/Responsiveness:
- (4) Satisfied/Above Average
- (3) Acceptable/Average
- (2) Marginally Acceptable/Below Average
- (1) Unacceptable

Comments: _____

_____

III. Budget Management/DBE Compliance:
- (4) Satisfied/Above Average
- (3) Acceptable/Average
- (2) Marginally Acceptable/Below Average
- (1) Unacceptable

Comments: _____

_____

ADDITIONAL COMMENTS: _____

_____

Composite Score = I + II + III / 3

IN WITNESS WHEREOF, This Agreement executed the day and year first above written.

FOR MILWAUKEE COUNTY:

Gregory G. High, Director (Date) DAS- Architecture, Engineering And Environmental Services	Teig Whaley Smith, Director (Date) Administrative Services
Stuart Carron, Director (Date) DAS- Facilities Management Division	Chris Abele, County Executive (Date) Office of the County Executive

APPROVED AS TO FUNDS AVAILABLE FOR WISCONSIN STATE STATUTES SECTION 59.255(2)(E):

Comptroller (Date)
Office of the Comptroller

REVIEWED AS TO DISADVANTAGED BUSINESS ENTERPRISE REQUIREMENTS (APPROVED WITH REGARD TO COUNTY ORDINANCE CHAPTER 42):

Community Business Development Partners (Date)

APPROVED AS TO FORM AND INDEPENDENT CONTRACT STATUS BY CORPORATION COUNSEL:

Corporation Counsel (Date)

REVIEWED AS TO INSURANCE REQUIREMENTS:

Risk Manager (Date)

APPROVED AS COMPLIANT UNDER SEC. 59.42(2)(B)5, STATS.:

Corporation Counsel (Date)

BY CONSULTANT / CONTRACTOR:

_____

Contracting Firms Name

_____ _____

Signature Date

_____

Title

N/A _____

Witnessed By

If Principal is a Corporation
IMPRINT CORPORATE SEAL